



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

DE-9J

15 March 1999

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

US EPA RECORDS CENTER REGION 5



1004379

K. Edward Nuernberg
BASF Corporation, Incorporated
1609 Biddle Avenue
Wyandotte, Michigan 48192

RE: BASF North Works, Wyandotte, Michigan
U.S. EPA Identification Number MID 064 197 742
QAPP Addendum and RFI Report

Dear Mr. Nuernberg:

The United States Environmental Protection Agency (U.S.EPA), Region 5, has received both the Quality Assurance Project Plan (QAPP), Addendum 1 for the Corrective Measures Study Field Program, and the RCRA Facility Investigation (RFI) Report.

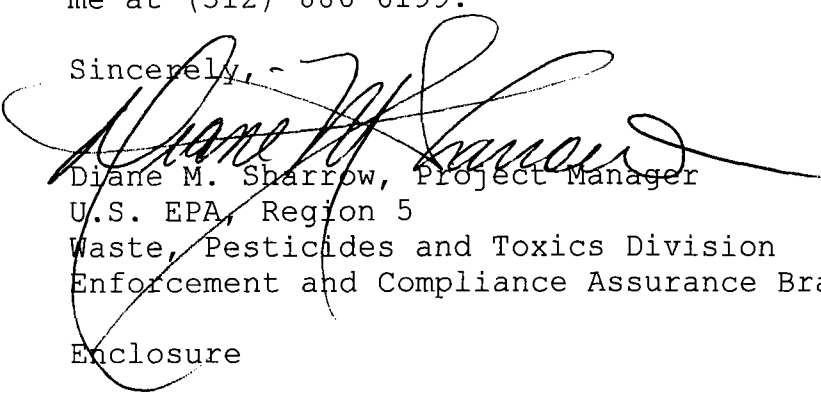
U.S. EPA has reviewed and approved the QAPP Addendum. Please find enclosed a signature page. Please note that U.S. EPA still needs a signature page with the original signatures from Quanterra.

U.S. EPA has also reviewed the RFI Report. The U.S. EPA has no further comments and is not placing any conditions on this RFI Report.

We are looking forward to the receipt of the final Corrective Measures Study (CMS), work plan that addresses the remainder of the tasks specified in the Consent Order Scope of Work (SOW), for the CMS Work plan, once the additional site specific data have been collected.

If you have any questions regarding this approval, please contact me at (312) 886-6199.

Sincerely,



Diane M. Sharrow, Project Manager
U.S. EPA, Region 5
Waste, Pesticides and Toxics Division
Enforcement and Compliance Assurance Branch

Enclosure

cc: J. Lanigan, BASF

QUALITY ASSURANCE PROJECT PLAN
ADDENDUM NO. 1

Prepared for the
CORRECTIVE MEASURES STUDY FIELD PROGRAM
BASF CORPORATION
EPA ID No. MID 064197742

WYANDOTTE, MICHIGAN
FEBRUARY 1999

Prepared by:
PARSONS ENGINEERING SCIENCE, INC.
1000 JORIE BOULEVARD, SUITE 250
OAK BROOK, ILLINOIS 60523



Mona D. Sutherland, Project Manager
Parsons Engineering Science, Inc.

2/5/99
Date



Kurt Blumer, CMS QA Manager
Parsons Engineering Science, Inc.

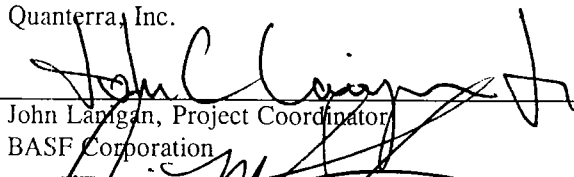
2/5/99
Date

Alesia Danford, Project Manager
Quanterra, Inc.

Date

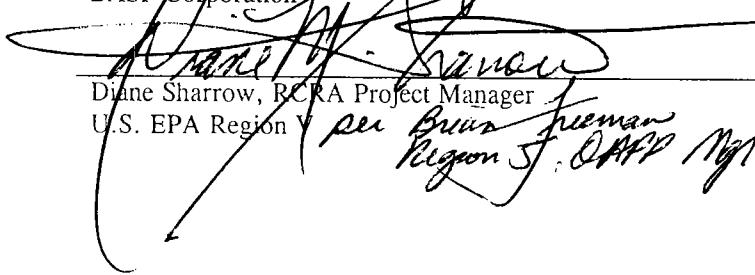
Opal Johnson, QA Manager
Quanterra, Inc.

Date



John Langan, Project Coordinator
BASF Corporation

2/4/99
Date



Diane Sharrow, RCRA Project Manager
U.S. EPA Region 5

2/17/99
Date

per Bruce Freeman
Region 5. QAPP Mgt. ECAB

K. Edward Nuernberg
General Manager
Wyandotte Site

DELIVERED BY PARSONS ENGINEERING SCIENCE

February 8, 1999

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (DRE-9J)
77 West Jackson Street
Chicago, Illinois 60604

Subject: Submittal of Quality Assurance Project Plan
Addendum No. 1
Corrective Measures Study
Docket No.: V-W-011-94
BASF Corporation, Wyandotte, Michigan

Dear Ms. Sharrow:

BASF Corporation presents two copies of Addendum No. 1 to our Quality Assurance Project Plan (QAPP) for the Wyandotte site. This Addendum describes the program to assure valid data of known quality are generated during the Corrective Measures Study field program. Specifically, this QAPP addresses procedures and tests that are new to the Corrective Action Program at Wyandotte, and were not used during the previous investigative phases.

This QAPP Addendum follows the structure of the EPA-approved QAPP for the Wyandotte site. Previously approved procedures have not changed. New tests and procedures are described in the text and follow those presented in the Work Plan approved by the EPA on November 20, 1998. New standard operating procedures (SOPs) are presented in the appendices.

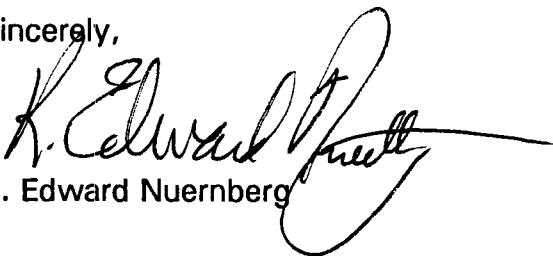
I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were

February 8, 1999

prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Should you need additional information, please contact Mr. Jack Lanigan (734-324-6219) at your convenience.

Sincerely,



K. Edward Nuernberg

Enclosure – Quality Assurance Project Plan, Addendum No. 1 (2 copies)

i:\ecology\jack\epa progress reports\QAPPaddendum1.doc

cc: J Lanigan – BASF
MSutherland - Parsons
RBlayer - MDEQ Lansing
LAubuchon - MDEQ Livonia
JRussell - MDEQ Livonia
ADanford - Quanterra (letter only)
BWallace - Bacon Memorial Public Library

BASF Corporation

BASF

November 1, 1996

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 607 934 575

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (DRE-8J)
77 West Jackson Street
Chicago, Illinois 60604

RECEIVED
NOV 12 1996
DIVISION FRONT OFFICE
Waste, Pesticides & Toxics Division
U.S. EPA - REGION 5

RE: Laboratory control limits

Dear Ms. Sharrow:

As a result of your telephone conversation with Ms. Opal Davis-Johnson at Quanterra concerning laboratory control limits, a footnote has been added to TABLE 3-1 and TABLE 3-2 of the QAPP. Also a typographical error on TABLE 3-2 has been corrected.

Three copies of the revised tables are enclosed; one copy is highlighted.

Sincerely,

Bruce Roberts

Bruce Roberts
Project Coordinator

enclosure

cc:

D. Yarborough - BASF (letter only)
R. Vitale - ESI
D. Marian - ESE
A. Danford - Quanterra
R. Blayer - MDEQ Lansing
L. Aubuchon - MDEQ Livonia
J. Russell - MDEQ Livonia
B. Wallace - Bacon Memorial Library

TABLE 3-1

**PRECISION AND ACCURACY CONTROL LIMITS
BASF CORPORATION, MICHIGAN RFI**

<u>Analyses</u>	<u>CONTROL LIMITS¹</u>			
	Recovery <u>Limits</u>	Water Relative Percent <u>Difference</u>	Recovery <u>Limits</u>	Soil Relative Percent <u>Difference</u>
VOC (8260A):				
1,1-Dichloroethene	55-142	(19)	NA	
Trichloroethene	77-124	(13)	NA	
Benzene	83-123	(13)	NA	
Toluene	82-122	(15)	NA	
Chlorobenzene	85-120	(10)	NA	
VOC (8240B):				
1,1-Dichloroethene	NA		60-136	(28)
Trichloroethene	NA		79-120	(16)
Benzene	NA		79-124	(19)
Toluene	NA		78-129	(21)
Chlorobenzene	NA		90-115	(20)
BNA (8270B):				
1,2,4-Trichlorobenzene	40-133	(35)	50-156	(60)
Acenapthenene	45-112	(28)	50-115	(60)
2,4-Dinitrotoluene	37-124	(34)	35-144	(85)
Pyrene	15-185	(45)	15-174	(61)
N-Nitrosodi-n-propylamine	10-230	(30)	10-230	(32)
1,4-Dichlorobenzene	33-90	(37)	39-105	(61)
Pentachlorophenol	10-122	(71)	38-129	(67)
Phenol	10-107	(35)	35-108	(100)
2-Chlorophenol	10-134	(28)	42-134	(81)
4-Chloro-3-methylphenol	21-120	(49)	39-138	(93)
4-Nitrophenol	10-144	(100)	42-131	(58)
Pesticides/PCB (8080A):				
Lindane	48-135	(51)	28-125	(51)
Heptachlor	56-158	(36)	24-168	(73)
Aldrin	54-120	(40)	31-123	(42)
Dieldrin	54-143	(32)	32-145	(43)
Endrin	64-142	(39)	32-137	(45)
4,4'-DDT	48-154	(47)	10-151	(50)
Herbicides (8150B)				
2,4-D	33-137	(32)	26-143	(39)
Silvex	35-139	(39)	28-130	(25)
2,4,5-T	22-139	(29)	10-141	(33)
Nonhalogenated VOC by GC (8015A):				
Propylene glycol	50-150	(50)	50-150	(50)
Propylene oxide	50-150	(50)	50-150	(50)

TABLE 3-1

**PRECISION AND ACCURACY CONTROL LIMITS
BASF CORPORATION, MICHIGAN RFI**

<u>Analyses</u>	<u>CONTROL LIMITS</u> ¹			
	Water		Soil	
	<u>Recovery Limits</u>	<u>Relative Percent Difference</u>	<u>Recovery Limits</u>	<u>Relative Percent Difference</u>
ICP Metals (6010A):				
Barium	80-120	(20)	80-120	(20)
Beryllium	80-120	(20)	80-120	(20)
Cobalt	80-120	(20)	80-120	(20)
Copper	80-120	(20)	80-120	(20)
Nickel	80-120	(20)	80-120	(20)
Tin	80-120	(20)	80-120	(20)
Zinc	80-120	(20)	80-120	(20)
Vanadium	80-120	(20)	80-120	(20)
ICP Trace Metals (6010A):				
Antimony	80-120	(20)	80-120	(20)
Arsenic	80-120	(20)	80-120	(20)
Cadmium	80-120	(20)	80-120	(20)
Chromium, Total	80-120	(20)	80-120	(20)
Lead	80-120	(20)	80-120	(20)
Selenium	80-120	(20)	80-120	(20)
Silver	80-120	(20)	80-120	(20)
Thallium	80-120	(20)	80-120	(20)
Cold Vapor Metals:				
Mercury (7470A)	31-160	(20)	NA	
Mercury (7471A)	NA		10-176	(20)
Inorganic Parameters:				
Cyanide (9012)	70-130	(20)	70-130	(20)
Sulfide (9030A)	70-130	(20)	NA	
Soil pH (9045C)	NA		NA	

¹ The control limits listed in the QAPP reflect the current control limits when the QAPP was written. Control limits are subject to change and are updated periodically. Control limits in effect at the time of project implementation are the control limits that will be used.

TABLE 3-2
CONTROL LIMITS FOR SURROGATES
BASF COMPONENT ¹

Analytical Method	Synonym Name	Water Recovery Limits		Solid Recovery Limits	
8260A	4-Bromofluorobenzene	86	115		
8260A	Toluene-d8	88	110		
8260A	Dibromofloromethane	86	118		
8080A	Dibutylchlorendate	10	155	19	130
8080A	Decachlorobiphenyl	60	150	60	150
8080A	Tetrachloro-m-xylene	14	155	30	170
8150B	2,4-DB	28	141	38	119
8150B	2,4-Dichlorophenylacetic	50	150	50	150
8240B	4-Bromofluorobenzene			74	121
8240B	1,2-Dichloroethane-d4			70	121
8240B	Toluene-d8			81	117
8270B	2-Fluorobiphenyl	38	106	43	109
8270B	2-Fluorophenol	17	106	28	101
8270B	2,4,6-Tribromophenol	13	145	10	170
8270B	Nitrobenzene-d5	36	148	52	131
8270B	Phenol-d5	15	126	37	117
8270B	p-Terphenyl-d14	10	169	37	150

¹ The control limits listed in the QAPP reflect the current control limits when the QAPP was written. Control limits are subject to change and are updated periodically. Control limits in effect at the time of project implementation are the control limits that will be used.

TABLE 3-1

**PRECISION AND ACCURACY CONTROL LIMITS
BASF CORPORATION, MICHIGAN RFI**

<u>Analyses</u>	<u>CONTROL LIMITS¹</u>			
	<u>Recovery Limits</u>	<u>Water</u> <u>Relative Percent</u> <u>Difference</u>	<u>Recovery Limits</u>	<u>Soil</u> <u>Relative Percent</u> <u>Difference</u>
VOC (8260A):				
1,1-Dichloroethene	55-142	(19)	NA	
Trichloroethene	77-124	(13)	NA	
Benzene	83-123	(13)	NA	
Toluene	82-122	(15)	NA	
Chlorobenzene	85-120	(10)	NA	
VOC (8240B):				
1,1-Dichloroethene	NA		60-136	(28)
Trichloroethene	NA		79-120	(16)
Benzene	NA		79-124	(19)
Toluene	NA		78-129	(21)
Chlorobenzene	NA		90-115	(20)
BNA (8270B):				
1,2,4-Trichlorobenzene	40-133	(35)	50-156	(60)
Acenaphthenene	45-112	(28)	50-115	(60)
2,4-Dinitrotoluene	37-124	(34)	35-144	(85)
Pyrene	15-185	(45)	15-174	(61)
N-Nitrosodi-n-propylamine	10-230	(30)	10-230	(32)
1,4-Dichlorobenzene	33-90	(37)	39-105	(61)
Pentachlorophenol	10-122	(71)	38-129	(67)
Phenol	10-107	(35)	35-108	(100)
2-Chlorophenol	10-134	(28)	42-134	(81)
4-Chloro-3-methylphenol	21-120	(49)	39-138	(93)
4-Nitrophenol	10-144	(100)	42-131	(58)
Pesticides/PCB (8080A):				
Lindane	48-135	(51)	28-125	(51)
Heptachlor	56-158	(36)	24-168	(73)
Aldrin	54-120	(40)	31-123	(42)
Dieldrin	54-143	(32)	32-145	(43)
Endrin	64-142	(39)	32-137	(45)
4,4'-DDT	48-154	(47)	10-151	(50)
Herbicides (8150B)				
2,4-D	33-137	(32)	26-143	(39)
Silvex	35-139	(39)	28-130	(25)
2,4,5-T	22-139	(29)	10-141	(33)
Nonhalogenated VOC by GC (8015A):				
Propylene glycol	50-150	(50)	50-150	(50)
Propylene oxide	50-150	(50)	50-150	(50)

TABLE 3-1

**PRECISION AND ACCURACY CONTROL LIMITS
BASF CORPORATION, MICHIGAN RFI**

<u>Analyses</u>	<u>CONTROL LIMITS</u> ¹			
	Recovery <u>Limits</u>	Water Relative Percent <u>Difference</u>	Recovery <u>Limits</u>	Soil Relative Percent <u>Difference</u>
ICP Metals (6010A):				
Barium	80-120	(20)	80-120	(20)
Beryllium	80-120	(20)	80-120	(20)
Cobalt	80-120	(20)	80-120	(20)
Copper	80-120	(20)	80-120	(20)
Nickel	80-120	(20)	80-120	(20)
Tin	80-120	(20)	80-120	(20)
Zinc	80-120	(20)	80-120	(20)
Vanadium	80-120	(20)	80-120	(20)
ICP Trace Metals (6010A):				
Antimony	80-120	(20)	80-120	(20)
Arsenic	80-120	(20)	80-120	(20)
Cadmium	80-120	(20)	80-120	(20)
Chromium, Total	80-120	(20)	80-120	(20)
Lead	80-120	(20)	80-120	(20)
Selenium	80-120	(20)	80-120	(20)
Silver	80-120	(20)	80-120	(20)
Thallium	80-120	(20)	80-120	(20)
Cold Vapor Metals:				
Mercury (7470A)	31-160	(20)	NA	
Mercury (7471A)	NA		10-176	(20)
Inorganic Parameters:				
Cyanide (9012)	70-130	(20)	70-130	(20)
Sulfide (9030A)	70-130	(20)	NA	
Soil pH (9045C)	NA		NA	

¹ The control limits listed in the QAPP reflect the current control limits when the QAPP was written. Control limits are subject to change and are updated periodically. Control limits in effect at the time of project implementation are the control limits that will be used.

TABLE 3-2
CONTROL LIMITS FOR SURROGATES
BASF COMPONENT¹

Analytical Method	Symonym Name	Water Recovery Limits		Solid Recovery Limits	
8260A	4-Bromofluorobenzene	86	115		
8260A	Toluene-d8	88	110		
8260A	Dibromofloromethane	86	118		
8080A	Dibutylchloredate	10	155	19	130
8080A	Decachlorobiphenyl	60	150	60	150
8080A	Tetrachloro-m-xylene	14	155	30	170
8150B	2,4-DB	28	141	38	119
8150B	2,4-Dichlorophenylacetic	50	150	50	150
8240B	4-Bromofluorobenzene			74	121
8240B	1,2-Dichloroethane-d4			70	121
8240B	Toluene-d8			81	117
8270B	2-Fluorobiphenyl	38	106	43	109
8270B	2-Fluorophenol	17	106	28	101
8270B	2,4,6-Tribromophenol	13	145	10	170
8270B	Nitrobenzene-d5	36	148	52	131
8270B	Phenol-d5	15	126	37	117
8270B	p-Terphenyl-d14	10	169	37	150

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**PRECISION AND ACCURACY CONTROL LIMITS
BASF CORPORATION, MICHIGAN RFI**

<u>Analyses</u>	<u>CONTROL LIMITS¹</u>			
	<u>Recovery Limits</u>	<u>Water Relative Percent Difference</u>	<u>Recovery Limits</u>	<u>Soil Relative Percent Difference</u>
VOC (8260A):				
1,1-Dichloroethene	55-142	(19)	NA	
Trichloroethene	77-124	(13)	NA	
Benzene	83-123	(13)	NA	
Toluene	82-122	(15)	NA	
Chlorobenzene	85-120	(10)	NA	
VOC (8240B):				
1,1-Dichloroethene	NA		60-136	(28)
Trichloroethene	NA		79-120	(16)
Benzene	NA		79-124	(19)
Toluene	NA		78-129	(21)
Chlorobenzene	NA		90-115	(20)
BNA (8270B):				
1,2,4-Trichlorobenzene	40-133	(35)	50-156	(60)
Acenaphthenene	45-112	(28)	50-115	(60)
2,4-Dinitrotoluene	37-124	(34)	35-144	(85)
Pyrene	15-185	(45)	15-174	(61)
N-Nitrosodi-n-propylamine	10-230	(30)	10-230	(32)
1,4-Dichlorobenzene	33-90	(37)	39-105	(61)
Pentachlorophenol	10-122	(71)	38-129	(67)
Phenol	10-107	(35)	35-108	(100)
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4,4'-DDT	48-154	(47)	10-151	(50)
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Propylene glycol	50-150	(50)	50-150	(50)
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TABLE 3-1

**PRECISION AND ACCURACY CONTROL LIMITS
BASF CORPORATION, MICHIGAN RFI**

CONTROL LIMITS¹

<u>Analyses</u>	Water		Soil	
	<u>Recovery Limits</u>	<u>Relative Percent Difference</u>	<u>Recovery Limits</u>	<u>Relative Percent Difference</u>
ICP Metals (6010A):				
Barium	80-120	(20)	80-120	(20)
Beryllium	80-120	(20)	80-120	(20)
Cobalt	80-120	(20)	80-120	(20)
Copper	80-120	(20)	80-120	(20)
Nickel	80-120	(20)	80-120	(20)
Tin	80-120	(20)	80-120	(20)
Zinc	80-120	(20)	80-120	(20)
Vanadium	80-120	(20)	80-120	(20)
ICP Trace Metals (6010A):				
Antimony	80-120	(20)	80-120	(20)
Arsenic	80-120	(20)	80-120	(20)
Cadmium	80-120	(20)	80-120	(20)
Chromium, Total	80-120	(20)	80-120	(20)
Lead	80-120	(20)	80-120	(20)
Selenium	80-120	(20)	80-120	(20)
Silver	80-120	(20)	80-120	(20)
Thallium	80-120	(20)	80-120	(20)
Cold Vapor Metals:				
Mercury (7470A)	31-160	(20)	NA	
Mercury (7471A)	NA		10-176	(20)
Inorganic Parameters:				
Cyanide (9012)	70-130	(20)	70-130	(20)
Sulfide (9030A)	70-130	(20)	NA	
Soil pH (9045C)	NA		NA	

¹ The control limits listed in the QAPP reflect the current control limits when the QAPP was written. Control limits are subject to change and are updated periodically. Control limits in effect at the time of project implementation are the control limits that will be used.

TABLE 3-2
CONTROL LIMITS FOR SURROGATES
BASF COMPONENT¹

Analytical Method	Synonym Name	Water Recovery Limits		Solid Recovery Limits	
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8080A	Decachlorobiphenyl	60	150	60	150
8080A	Tetrachloro-m-xylene	14	155	30	170
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8150B	2,4-Dichlorophenylacetic	50	150	50	150
8240B	4-Bromofluorobenzene			74	121
8240B	1,2-Dichloroethane-d4			70	121
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8270B	Phenol-d5	15	126	37	117
8270B	p-Terphenyl-d14	10	169	37	150

¹ The control limits listed in the QAPP reflect the current control limits when the QAPP was written. Control limits are subject to change and are updated periodically. Control limits in effect at the time of project implementation are the control limits that will be used.

21 October 1996

DRE-8J

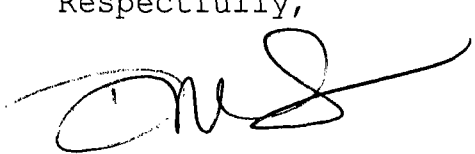
Bruce Roberts
BASF Corporation
1609 Biddle Avenue
Wyandotte, Michigan 48192

RE: North Works
MID 064 197 742

Dear Mr. Roberts:

This letter is in response to your telephone call of late last week. Via this letter I am confirming that the revisions to the QAPP/SOPs submitted September 3, 1996, were received and approved, and the conditional approval removed. The QAPP is now fully approved. If you have any questions, do not hesitate to contact me at (312) 886-6199.

Respectfully,

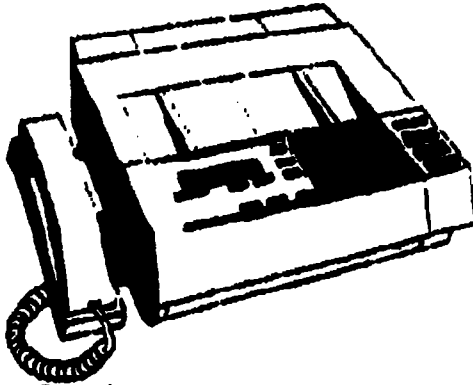


Diane M. Sharrow
Environmental Scientist
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: R. Blayer, DEQ
L. Aubuchon, DEQ - Livonia
J. Russell, DEQ - Livonia
D. Payne, USEPA

Waste, Pesticides & Toxics Division
Enforcement & Compliance Assurance Branch
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Mailcode HRE-8J
Chicago, Illinois 60604

FACSIMILE REQUEST



To: Bruce Roberts, BASF
Office/Phone (312) 246-6100
Facsimile Number (313) 246 6775
Verification Number _____

From: Diane Sharrow
Office/Phone 312-886-6199
Date: 10/22/96 Number of Pages: 2
Additional Comments:

SENT FROM FACSIMILE NO.
(312) 353-4788

TRANSMIT CONFIRMATION REPORT

Deane Shaw

NO. : 011
RECEIVER : BASF ADMINISTRATION
TRANSMITTER : USEPA REG 5
DATE : OCT 22'96 11:09
DURATION : 00'57
MODE : STD
PAGES : 02
RESULT : OK

September 3, 1996

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (DRE-8J)
77 West Jackson Street
Chicago, Illinois 60604

RE: Health & Safety Plan, Project Management Plan, QAPP, Field SOP, and Lab SOP Revisions

Dear Ms. Sharrow:

Minor revisions have been made to the Health & Safety Plan, the Project Management Plan, the QAPP, the Field SOPs, and the Lab SOPs. Three copies of the affected pages are attached and one copy is highlighted. The revisions are explained below.

These revisions should satisfy all of the requirements specified in EPA's Conditional Approval and subsequent discussions with EPA's Mr. David Payne.

Health and Safety Plan

The Health and Safety Plan has been revised to correct typographical errors, update the ESE personnel change, and allow the use of Tyvek® booties. A summary of the changes is:

- Page 2-1 -- add "by" in the last sentence
- Page 2-2 -- correct spelling of Mulberry in Section 2.1
- Page 3-1 -- change Bob Veenstra to Douglas Marian
- Page 5-3 -- change HSAP to HASP and change WCC to ESE
- Page 6-1 -- add Tyvek® booties
- Page 6-2 -- add Tyvek® booties and commas in sixth bullet of Section 6.1.2
- Page 6-4 -- add Tyvek® booties for level D and level C PPE
- Page 6-6 -- add Tyvek® booties for level D and level C PPE

Project Management Plan

Mr. Robert Veenstra, ESE's Project Manager, has left their company and has been replaced with Mr. Douglas Marian. Replace page 3-3 and FIGURE 2 with the revised pages and add FIGURE 3.

QAPP

The QAPP COPY HOLDERS sheet has been revised by eliminating D. Yarborough from the list and to show that the library copy is no longer pending EPA approval. Since ESE's Project Manager has been replaced, replace Section 2.0, page 3 of 8 and FIGURE 2-2 with the revised

pages. EPA's requirement of reducing the sample size from 30 grams to 5 grams in the herbicide procedure has affected the method detection limit of pentachlorophenol. It increased from 2 µg/kg to 5 µg/kg. TABLE 7-4 page 15 has been revised to reflect the increase; replace the existing page with the revised one. In addition, the project schedule has been revised; replace the old schedule with the revised one. The field investigation of the SWMUs and AOCs required more time than originally envisioned.

FIELD SOPs

APPENDIX B TABLE OF CONTENTS

The revisions to the field SOPs have affected the TABLE OF CONTENTS. Page i has been revised to show the name change of the field boring log. Page viii has been revised to reflect the changes in SOP-13. Page ix has been revised by eliminating the DATA SHEET - ELECTRICAL RESISTIVITY SOUNDINGS. Page xii has been revised to reflect the revision in the order of forms, the name change of the field boring log, and the elimination of the DATA SHEET - ELECTRICAL RESISTIVITY SOUNDINGS. Replace existing pages with the revised pages.

Field SOP-1

FIGURE SOP-1-1 and FIGURE SOP-1-2 had been omitted previously. The new page is to be inserted at the end of field SOP-1.

Field SOP-2

The field boring log was changed from the one used by Woodward Clyde to the one used by ESE. It contains all of the essential information and its use should minimize errors. Replace the existing form at the end of SOP-02 with the new one.

Field SOP-13

Field SOP-13 has been revised. The electrical resistivity equipment specified in the existing SOP is no longer available. The revised SOP specifies equipment that is currently available. Also, the technique is slightly different. Replace the existing SOP with the revised one.

Field SOP-18

The GROUNDWATER SAMPLE COLLECTION FIELD SHEET form has been revised to show ESE's name and address. Replace the existing form with the revised form.

Field SOP-19

Page 2 has been revised to reflect the elimination of a form. The Chain of Custody form is to be inserted as the first form in field SOP-19 and the FIELD BORING LOG form is to be replaced with the LOG OF WELL form. The "DATA SHEET - ELECTRICITY RESISTIVITY SOUNDINGS" form is no longer required and needs to be removed from field SOP-19. A replacement page for the EQUIPMENT DECONTAMINATION/WASH CHECKLIST AND RECORD form is attached. Replace the existing GROUNDWATER SAMPLE COLLECTION FIELD SHEET form with the revised one.

LAB SOPs

SOP NC-WC-0032 has been revised to increase the MS/MSD frequency from one per batch to one per 7 samples. In addition, some samples collected in the Prussian blue area will be spiked with a sodium thiocyanate solution to assess the potential impact of thiocyanate in the original sample. Add the attached addendum to the end of SOP NC-WC-0032.

SOP LM-WALN-4110 has been revised by decreasing the non aqueous sample mass from 30 grams to 5 grams. Section 11.4.2 was revised to state that DCAA will be the only surrogate. Table 5 was revised concerning surrogate concentrations. Add the attached addendum to the end of SOP LM-WALN-4110.

SOP CORP-GC-0001 section 17.3 has been revised by reducing the extraction volume and eliminating the 20 fold dilution. Add the attached addendum to the end of SOP CORP-GC-0001.

SOP CORP-MT-0001 Table IV and Table IVA have been revised in order to achieve the Targeted Quantitation Limits listed in the QAPP. Values for barium and copper were revised in Table IV and values for antimony, arsenic, and cadmium were revised in Table IVA. Replace existing SOP pages with the revised pages.

Also attached is the Soil SRM Data report that was requested by Mr. Payne.

Sincerely,



Don Yarborough
Wyandotte Site Manager

cc:

B. Roberts - BASF
R. Vitale - ESI (letter only)
D. Marian - ESE
T. Himes - Quanterra
R. Blayer - MDEQ Lansing
L. Aubuchon - MDEQ Livonia
J. Russell - MDEQ Livonia

addressed by BASF and documented. BASF should also document when contaminated soil is redeployed, where it is spread, and how thick it is spread.

The CCR will not have to be revised because it is a static document.

3. Proposed addition of Rail Road Tracks

BASF is planning to install new rail road tracks inside the assumed boundaries of AOC 1 and AOC 8. For civil engineering reasons, the top four feet of soil under the track area would have to be removed and replaced with particular sized rock. Historical sampling near the area has shown the presence of BTEX and stryene. No QAPP sampling in the area was proposed.

The same items that were discussed for the warehouse were discussed again.

4. Field SOP 20

BASF is proposing to use differential GPS (sub meter accuracy) to locate the final sampling locations, excluding wells. The accuracy of the GPS technique is not as great as traditional surveying techniques, but is sufficient to meet the objectives of the QAPP. EPA did not object to using this technology; BASF will submit a revised SOP.

5. Documents to be submitted to the local library

A copy of all of the bound documents (QAPP, CCR, DMP, PMP, etc.) and a copy of the monthly progress reports are to be sent to the library.

6. HASP

ESE has revised the HASP and it is more conservative; a copy will be submitted to EPA.

7. Interim Measures

There was a general discussion on Interim Measures (IM). EPA's emphasis for using IM is to stabilize a situation in a more rapid manner. There is no bright line that dictates when an IM should be initiated. EPA has issued guidance on IM workplans and the amount of EPA oversight would depend upon the specific situation. An action initiated by a company on its own may not be accepted as part of the final corrective measures by EPA. It would be prudent to discuss potential IM actions with EPA before implementation.

Ms. Sharrow will send Mr. Roberts a copy of EPA's 1991 guidance memorandum "Managing the Corrective Action Program for Environmental Results: The RCRA Facility Stabilization Effort."

July 25, 1996

**Certified Mail
Return Receipt Requested
P 254 185 256**

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (DRE-8J)
77 West Jackson Street
Chicago, Illinois 60604

RECEIVED
JUL 29 1996

RE: Verification of our Telephone Conversation on June 27, 1996

**OFFICE OF RCRA
WASTE MANAGEMENT DIVISION
EPA, REGION V**

Dear Ms. Sharrow:

Below is a summary of the items discussed.

1. Laboratory SOPs

EPA will be sending BASF a letter specifies the lab SOP changes and changes that are required for QAPP approval (excluding the Prussian Blue area which will be addressed in early July). The changes are based upon EPA's Mr. David Payne's review of the lab SOPs and conversations with Quanterra. Analysis for hexachlorophene will not be required.

BASF will be submitting revised QAPP section 7 table pages which reflect dropping hexachlorophene and assign values to those items that were shown as "ND."

BASF will submit the lab SOP addendums as soon as possible.

2. Proposed Regional Warehouse at Northworks

BASF is planning to build a regional warehouse near the south end of the property. As presently envisioned, a portion of the warehouse would overlap a portion of assumed boundary of SWMU G. For civil engineering reasons, the top foot of material would be removed. Sampling in the area as specified in the QAPP would be completed before any construction begins.

As discussed, BASF should submit a letter to EPA detailing our plans. Formal approval from EPA is not required, but EPA should be apprised of the situation and given the opportunity to comment on the plans. EPA is concerned about the management of the removed soil if it is contaminated. RCRA hazardous soil would have to be managed as a RCRA waste. Non RCRA hazardous but contaminated soils, could be redeployed on site. BASF would have the burden to remove hot spots in the soil and to ensure that the redeployed soil is not a threat to human health or the environment. The potential for contaminants from the redeployed soil to leach into the Detroit River or for new contaminants to be introduced into an area should be

Group two and three soils will be stockpiled within the AOC footprint . An evaluation of the risks of reusing the soils on site will be conducted. If the risks are acceptable, the soils will be reused. The volume of soil reused and its location will be documented for future reference.

Group four soils will be designated for disposal in either a hazardous waste landfill or incinerated depending upon their treatability and levels of contamination.

The first round of sampling for the project began the week of July 8th and the next round is scheduled for early August.

Actual construction is anticipated to begin in September.

The general sequence of events is proposed to proceed as follows:

1. Conduct soil sampling
2. Evaluate analytical results for soil disposition.
3. Excavate railroad bed.
4. Fill excavation to grade with appropriate railroad ballast.
5. Stockpile and redeploy removed soils as appropriate.
6. Lay ties and tracks.

If you have any concerns with either of these projects, let us know. BASF realizes that there are risks involved with reusing the soils elsewhere on site, but we will ensure that redeploying the soils is not a threat to human health or the environment. BASF will maintain a record of the time of and relocation of redeployed soils.

Sincerely yours,



Bruce Roberts
Project Coordinator

cc:

G. McDonough
D. Sheaves
D. Thiel
D. Webster
D. Yarborough

New Railroad Tracks

BASF is planning to build a new set of railroad tracks parallel to and west of existing tracks. The proposed location for the tracks run through Areas of Concern 1 and 8 which are shown in QAPP FIGURE 1-2. Construction of the rail bed will require the excavation of approximately 6,000 to 8,000 cubic yards of soil. The principle concern is the extent of contamination within AOC #8 which has been identified due to historical styrene contamination and AOC #1 which has contamination due to toluene releases in the past. Due to this contamination, the State of Michigan regulates soils that are contaminated due to spills of commercial chemical products such as styrene and toluene as "listed hazardous wastes" under the provisions of Michigan Public Act 451 part 111. Existing data indicate that styrene contamination within AOC #8 ranges from no detectable levels to approximately 2 mg/L. Toluene contamination within AOC #1 ranges from 0.22 ppm to 57.6 ppm in the excavation footprint.

No sampling associated with the QAPP is planned for this area, so a contractor will further delineate the subsurface concentrations by collecting a total of 51 samples from 22 locations in the area of the proposed tracks. Based on the results obtained from the sampling program a waste minimization plan can be established. This plan will attempt to minimize the amount of overburden sent to an off-site location for disposal.

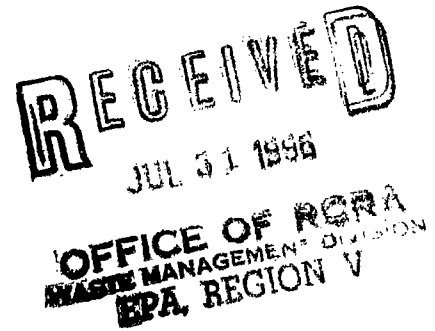
Disposition of the overburden will be based on contaminant levels. This will break down into four distinct groups:

- Group one will be soils that pass the first round of analytical sampling which will include the analytes benzene, ethyl benzene, toluene, xylenes, and styrene. Passing will be defined as no-detectable levels of toluene or styrene and levels below 50 mg/Kg of benzene.
- Group two will consist of soils that show detectable levels of toluene and styrene but are below the Land Disposal Restriction Notification levels of 10 mg/Kg for benzene, ethyl benzene and toluene.
- Group three will consist of soils meeting criteria two but with LDR levels between 10 mg/Kg and 100 mg/Kg of benzene, toluene, ethyl benzene.
- Group four will be those soils which exceed the Group three parameters and any soils that exhibit a hazardous characteristic such as ignitability or TCLP concentration for benzene of greater than 5.0 mg/L.

Group one soils will be subjected to a second round of analytical work to verify acceptability for use elsewhere on the site as back fill or drainage improvement. These soils will be subjected to a full EPA Appendix IX analysis to verify the presence of any constituents of concern and for historical purposes. An evaluation of the risks of reusing the soils on site will be conducted. If the risks are acceptable, the soils will be reused. The volume of soil reused and its location will be documented for future reference.

July 29, 1996

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (DRE-8J)
77 West Jackson Street
Chicago, Illinois 60604



RE: Plans to Build a Regional Warehouse and New Railroad Tracks at Northworks

Dear Ms. Sharrow:

As discussed in our June 27 telephone conversation, BASF plans to build a regional warehouse and new railroad tracks at the Northworks site. Below is a brief description of each plan.

Regional Warehouse

A new 140,000 sq ft warehouse would be built on the south end of the Northworks site and a portion of the warehouse would overlap the area designated as the possible extent of SWMU G as shown in QAPP FIGURE 1-13. SWMU G is the area that was used to stage demolition debris prior to off site disposal. Gross soil contamination associated with debris staging is not anticipated. Construction is not anticipated to begin before September. The final design of the warehouse has not been determined yet. Most likely, some of the footings would penetrate into the existing soil (this is different from what I said during our telephone conversation). The general sequence of events is proposed as follows:

1. Conduct geotechnical borings in the area to determine soil characteristics.
2. Follow QAPP for soil sampling in SWMU G. (Appendix IX compounds)
3. Evaluate analytical results for soil disposition and potential impact on warehouse.
4. Collect soil samples around the perimeter of the warehouse (depth to be determined after warehouse design has been completed).
5. Evaluate analytical results for soil disposition and potential impact on warehouse.
6. Remove top foot of material to allow proper compaction for building construction.
7. Reuse soil on site if possible. If non contaminated, soil would be used on site. If soil is contaminated, manage according to Michigan Public Act 451 Part 111. The volume of soil reused and its location will be documented for future reference.
8. Build up construction area with 4-6 feet of fill.
9. Construct warehouse. The perimeter footings for walls will probably require excavation that would extend below the existing grade. The interior column footings will probably not require excavation into the existing soils. The excavated soils would be handled as stated in number 7 above.

8. EPA site visit

The anticipated sampling schedule was discussed. EPA personnel will be on site during a portion of the sampling activities to verify appropriate techniques are being followed. EPA will contact BASF to schedule the site visit.

Sincerely yours,

A handwritten signature in cursive script that reads "Bruce Roberts".

Bruce Roberts
Project Manager



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUN 27 1996

REPLY TO THE ATTENTION OF:

DRT-14J

MEMORANDUM

SUBJECT: Review of BASF Corporation's Response
to March 11, 1996 Conditional Approval of RCRA
Facility Investigation (RFI) Quality Assurance
Project Plan (QAPP)

FROM: David A. Payne, Chemist *D. Payne*
Toxics Program Section
Waste, Pesticide & Toxics Division

TO: Diane Sharrow, Environmental Scientist
Enforcement and Compliance Assurance Branch (DRE-8J)
Waste Pesticide & Toxics Division

I have reviewed the May 17, 1996 response of BASF Corporation versus the conditional QAPP approval of the RFI, and versus the March 8, 1996 laboratory evaluation report for Quanterra Environmental Services, North Canton, Ohio.

Subsequent to the laboratory evaluation report Quanterra has replaced facility specific SOPs for Methods 6010A, 8240B, 8260A, 8270B, 8080A, and 8151 with corporate SOPs. The corporate 8000 series organic test procedures reflect changes mandated by Update III to SW-846, and require common, corporate calibration standard mixtures throughout the Quanterra system. Method 6010A reflects Update II to SW-846 as Update III made no changes to this metals test procedure. The May 17th response provides QAPP updates to reflect these SOP changes, with laboratory facility specific addendums to corporate SOPs for Methods 8240B, 8260A, and 8270B. Other updated corporate and facility specific SOPs of Quanterra are included in the May 17 submission; however, these test procedures, except for cyanide, were deemed acceptable by the March 8, 1996 laboratory evaluation report. A review memo on cyanide will be given to you next week, indicating the positive steps taken by Quanterra's North Canton laboratory to correct the problems, identified in the March 8 memo report, for cyanide.

I have discussed the May 17, 1996 BASF response with BASF personnel and with Quanterra's North Canton staff. The responses of BASF and Quanterra should be considered acceptable for the RFI with the following 3 changes:

1. A facility specific addendum is made to the Quanterra corporate SOP for Method 6010A to maintain reporting limits of QAPP Table 7-4.
2. A facility specific addendum is made to the corporate SOP for Method 8151 and to the facility SOP (LW-WALN-4110) for Method 8151 sample preparation, in order to reflect actual operations and the specifications of QAPP Tables 3-1, 3-2, and 7-4.
3. The Quanterra North Canton report for analyzing metals in NIST SRMs 2709, 2710, and 2711 will be changed by comparing experimental ICP results to Method 3050 defined "mean values", in addition to comparison to NIST certified values. The NIST Method 3050 Addendum to the SRMs was provided to BASF and Quanterra by FAX on June 20, 1996.

Quanterra, North Canton, Ohio will soon complete the above 3 items. I recommend the May 17, 1996 response of BASF be considered acceptable for RFI QAPP approval, including cyanide for non-Prussian Blue areas.

I. DETAILS

A. Metals - Method 6010A

The Quanterra corporate SOP is in place at the North Canton facility, including specifications for use of the ICP Trace instrument. Instrument calibration standards, QC solution concentrations, and acceptance criteria for their results are defined by the corporate SOP. Reporting limits have changed (increased) for 50% of the target metals, versus the previous facility specific SOP. Corporate SOP changes do not reflect QAPP specifications.

Quanterra has agreed to maintain performance of the facility specific SOP by writing an SOP addendum. The addendum will reflect previous acceptance criteria for preparation and calibration blanks defined by the reporting limit of QAPP Table 7-4. An additional QC audit solution, labeled "CRI", will be fabricated to reflect required reporting limits, and will be tested with BASF samples.

B. Cyanide

Separate communications have been provided by Quanterra in May 1996 to document successful corrective actions for the QC audit deficiency identified in my memo report of May 8, 1996. I will provide a separate memo report for cyanide testing, including the "Prussian Blue" area, next week. Quanterra has corrected the general deficiency cited for cyanide determinations of all sample types.

C. Herbicides - Method 8151

Two SOPs are provided by Quanterra for Method 8151. The facility specific SOP is used for sample preparation of soils and waters. The corporate SOP will be used for instrument operations. QAPP reporting limits (QAPP Table 7-4) and QC criteria (QAPP Tables 3-1 and 3-2) are defined by the facility SOP. The Quanterra North Canton facility did not change either Method 8151 SOP for Method 8151 to address corrective actions recommended by my memo of March 8, 1996 concerning sample extract dilution (soil) and surrogate and matrix spike concentrations exceeding the calibration range of the system. The SOPs are still imprecise and do not define actual operations.

Quanterra, North Canton, agreed to provide an addendum to their Method 8151 SOPs:

1. Five (5) grams soil (representative aliquot) will be extracted instead of 50g. Soil extracts will not be diluted 10 fold. One liter of water will be extracted and methylated to a final volume of 10 mls.
2. Surrogate spikes will be defined precisely. Surrogate and matrix spike concentrations will be selected to fit the instrumental calibration range.

D. Other Items

1. Method 8080A

The corporate SOP will be used for the BASF RFI starting in July 1996. Calibration standard concentrations, extraction volumes and the surrogate spike compounds will be defined by the corporate SOP, but no changes in QAPP reporting limits are expected. A precise definition of instrument calibration details, unique to the North Canton facility, will disappear through use of the corporate SOP (life must go on).

2. Test Procedure Changes for Specific Appendix IX Compounds

Quanterra has appropriately updated Method 8260A calibration standard concentrations for water miscible volatiles and has changed test procedures for certain "problem" Appendix IX compounds (1,4-dioxane, hexachlorophene, etc.) as recommended by March 8, 1996 lab evaluation report. Certain items need better definition:

- a. Corporate SOPs do not reflect these methodology changes. The QAPP will take precedence over corporate SOPs.

- b. Recommended changes have occurred successfully, except in one instance. Quanterra has not been able to detect hexachlorophene by Method 8151, or determine reasons for non-detection. Hexachlorophene will then not be reported for the RFI. It is acceptable not to report hexachlorophene as the compound would not have been detected by Method 8270. This is a QAPP change, of minor consequence.
- c. Acetonitrile and allyl chloride are now in separate calibration solutions for Method 8240B and 8260A. The standard containing allyl chloride is a corporate provided standard and still contains acetonitrile, but the allyl chloride response overwhelms that of acetonitrile. Allyl chloride is quantified using ion 76 which has no mass spectral interference from acetonitrile. The ESI validator needs to be aware of this item.

c.c. A. Kerbs, ECAB

From: DAVID PAYNE
To: R5WST.R5RCRA.SHARROW-DIANE
Date: 5/14/96 2:46pm
Subject: Cyanide QC Limits--Quanterra(OH)---BASF RFI

As part of the lab evaluation report for Quanterra Environmental Services, North Canton, OH, we asked the lab to correct and improve their QC acceptance limits for cyanide analysis. During 1995-96 the lab found the the problem to be caused by an impurity in the absorber reagent(s).

On 5-3-96 I received a FAX from Quanterra documenting correction of the previous problem(s). A summary of acceptable QC audit results was provided for the time period of 1-2-96 to 4-25-96. The data are for matrix spike recoveries from waters. I asked to see the same data for soils, but have not received them. Dr Mark

Bruce of Quanterra said the soil QC results are the same quality as the water data--recoveries are within 70 to 130%.

Correction of the cyanide problem is the last major and outstanding deficiency for the BASF(MI) RFI. You can send them into the field with my blessing(less the Prussian Blue nightmare). BASF and Quanterra should be complimented for their patience. There is still be a SOP problem to resolve with the lab. The lab has to resolve format with BASF, and submit new SOPs to demonstrate correction of deficiencies for organics(volatiles, herbicides, etc.) per the lab audit report. I beleive the cyanide problem has

been corrected for routine samples---the rest will follow at the pace set by BASF/Quanterra.

This is an update---I will be on vacation tomorrow until 5-28-96.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUN 27 1996

REPLY TO THE ATTENTION OF:

DRT-14J

MEMORANDUM

SUBJECT: Review of BASF Corporation's Response
to March 11, 1996 Conditional Approval of RCRA
Facility Investigation (RFI) Quality Assurance
Project Plan (QAPP)

FROM: David A. Payne, Chemist *DA Payne*
Toxics Program Section
Waste, Pesticide & Toxics Division

TO: Diane Sharrow, Environmental Scientist
Enforcement and Compliance Assurance Branch (DRE-8J)
Waste Pesticide & Toxics Division

I have reviewed the May 17, 1996 response of BASF Corporation versus the conditional QAPP approval of the RFI, and versus the March 8, 1996 laboratory evaluation report for Quanterra Environmental Services, North Canton, Ohio.

Subsequent to the laboratory evaluation report Quanterra has replaced facility specific SOPs for Methods 6010A, 8240B, 8260A, 8270B, 8080A, and 8151 with corporate SOPs. The corporate 8000 series organic test procedures reflect changes mandated by Update III to SW-846, and require common, corporate calibration standard mixtures throughout the Quanterra system. Method 6010A reflects Update II to SW-846 as Update III made no changes to this metals test procedure. The May 17th response provides QAPP updates to reflect these SOP changes, with laboratory facility specific addendums to corporate SOPs for Methods 8240B, 8260A, and 8270B. Other updated corporate and facility specific SOPs of Quanterra are included in the May 17 submission; however, these test procedures, except for cyanide, were deemed acceptable by the March 8, 1996 laboratory evaluation report. A review memo on cyanide will be given to you next week, indicating the positive steps taken by Quanterra's North Canton laboratory to correct the problems, identified in the March 8 memo report, for cyanide.

I have discussed the May 17, 1996 BASF response with BASF personnel and with Quanterra's North Canton staff. The responses of BASF and Quanterra should be considered acceptable for the RFI with the following 3 changes:

1. A facility specific addendum is made to the Quanterra corporate SOP for Method 6010A to maintain reporting limits of QAPP Table 7-4.
2. A facility specific addendum is made to the corporate SOP for Method 8151 and to the facility SOP (LW-WALN-4110) for Method 8151 sample preparation, in order to reflect actual operations and the specifications of QAPP Tables 3-1, 3-2, and 7-4.
3. The Quanterra North Canton report for analyzing metals in NIST SRMs 2709, 2710, and 2711 will be changed by comparing experimental ICP results to Method 3050 defined "mean values", in addition to comparison to NIST certified values. The NIST Method 3050 Addendum to the SRMs was provided to BASF and Quanterra by FAX on June 20, 1996.

Quanterra, North Canton, Ohio will soon complete the above 3 items. I recommend the May 17, 1996 response of BASF be considered acceptable for RFI QAPP approval, including cyanide for non-Prussian Blue areas.

I. DETAILS

A. Metals - Method 6010A

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Quanterra has agreed to maintain performance of the facility specific SOP by writing an SOP addendum. The addendum will reflect previous acceptance criteria for preparation and calibration blanks defined by the reporting limit of QAPP Table 7-4. An additional QC audit solution, labled "CRI", will be fabricated to reflect required reporting limits, and will be tested with BASF samples.

B. Cyanide

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C. Herbicides - Method 8151

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Quanterra, North Canton, agreed to provide an addendum to their Method 8151 SOPs:

1. Five (5) grams soil (representative aliquot) will be extracted instead of 50g. Soil extracts will not be diluted 10 fold. One liter of water will be extracted and methylated to a final volume of 10 mls.
2. Surrogate spikes will be defined precisely. Surrogate and matrix spike concentrations will be selected to fit the instrumental calibration range.

D. Other Items

1. Method 8080A

The corporate SOP will be used for the BASF RFI starting in July 1996. Calibration standard concentrations, extraction volumes and the surrogate spike compounds will be defined by the corporate SOP, but no changes in QAPP reporting limits are expected. A precise definition of instrument calibration details, unique to the North Canton facility, will disappear through use of the corporate SOP (life must go on).

2. Test Procedure Changes for Specific Appendix IX Compounds

Quanterra has appropriately updated Method 8260A calibration standard concentrations for water miscible volatiles and has changed test procedures for certain "problem" Appendix IX compounds (1,4-dioxane, hexachlorophene, etc.) as recommended by March 8, 1996 lab evaluation report. Certain items need better definition:

- a. Corporate SOPs do not reflect these methodology changes. The QAPP will take precedence over corporate SOPs.

- b. Recommended changes have occurred successfully, except in one instance. Quanterra has not been able to detect hexachlorophene by Method 8151, or determine reasons for non-detection. Hexachlorophene will then not be reported for the RFI. It is acceptable not to report hexachlorophene as the compound would not have been detected by Method 8270. This is a QAPP change, of minor consequence.
- c. Acetonitrile and allyl chloride are now in separate calibration solutions for Method 8240B and 8260A. The standard containing allyl chloride is a corporate provided standard and still contains acetonitrile, but the allyl chloride response overwhelms that of acetonitrile. Allyl chloride is quantified using ion 76 which has no mass spectral interference from acetonitrile. The ESI validator needs to be aware of this item.

c.c. A. Kerbs, ECAB

From: DAVID PAYNE
To: R5WST.R5RCRA.SHARROW-DIANE
Date: 5/14/96 2:46pm
Subject: Cyanide QC Limits--Quanterra(OH)---BASF RFI

As part of the lab evaluation report for Quanterra Environmental Services, North Canton, OH, we asked the lab to correct and improve

their QC acceptance limits for cyanide analysis. During 1995-96 the lab found the the problem to be caused by an impurity in the absorber reagent(s).

On 5-3-96 I received a FAX from Quanterra documenting correction of the previous problem(s). A summary of acceptable QC audit results was provided for the time period of 1-2-96 to 4-25-96. The data are for matrix spike recoveries from waters. I asked to see the same data for soils, but have not received them. Dr Mark

Bruce of Quanterra said the soil QC results are the same quality as the water data--recoveries are within 70 to 130%.

Correction of the cyanide problem is the last major and outstanding

deficiency for the BASF(MI) RFI. You can send them into the field with my blessing(less the Prussian Blue nightmare). BASF and Quanterra should be complimented for their patience. There is still be a SOP problem to resolve with the lab. The lab has to resolve format with BASF, and submit new SOPs to demonstrate correction of deficiencies for organics(volatiles, herbicides, etc.) per the lab audit report. I beleive the cyanide problem has

been corrected for routine samples---the rest will follow at the pace set by BASF/Quanterra.

This is an update---I will be on vacation tomorrow until 5-28-96.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

APR 19 1996

DRT-14J

MEMORANDUM

SUBJECT: Environmental Standards, Inc. (ESI)
SOPs for Data Review/Validation

FROM: David A. Payne, Chemist
TPS, WPTD

A handwritten signature in dark ink, appearing to read "D. Payne".

TO: Dianne Sharrow, Environmental Scientist
Enforcement and Compliance Assurance Branch
(DRE-8J)

As the dust has settled from the laboratory evaluation of Quanterra Environmental Services, North Canton, Ohio, I have reviewed again data review/validation SOPs of Environmental Standards, Inc. (ESI). The SOPs are equivalent to data review guidelines for EPA's Contract Laboratory Program (CLP) for Target Compound List (TAL) organics. The SOPs do not discuss any specific items for the additional organic compounds necessary for Appendix IX. The SOPs are generally acceptable in concept for data validation.

The ESI SOPs for metals and cyanide should not be significantly effected by extra Appendix IX elements. Appendix IX includes the element tin, but the CLP Target Analyte List (TAL) does not. Tin has poor analytical performance compared to other ICP elements, but I have never known tin to ever be a factor at any RCRA or Superfund site in Region 5. The EST SOPs may not specifically address the ICP Trace instrument, but ESI staff are known to be knowledgeable on its use. When Quanterra completes its work on cyanide, the laboratory should meet, or exceed the criteria established by ESI for acceptable cyanide data. The remainder of this memo will discuss ESI SOPs for organic analysis data. I believe that ESI will not be troubled by the comments below:

ESI should consider, or re-evaluate their SOPs for the following items:

1. The ESI SOPs were written in mid-1995, for use of less than 30% for the % RSD of initial calibration for Methods 8240, 8260, and 8270. SW-846, Update II, now requires less than 15% for initial calibration. I briefly looked at the Method 8260A corporate Quanterra SOP. This specifies 80% of the volatile target compounds shall have an initial calibration with a % RSD less than 15%. This is an unique twist.

2. ESI's SOP for volatiles is written for a 5 ml purge volume, not the 25 ml purge volume of Method 8260. Water miscible volatiles (acetone, acrolein, etc) behave differently as discussed in lab evaluation memo for Quanterra, for 5 ml and 25 ml sample aliquots.
3. ESI's SOPs use a minimum relative response factor (RRF) of 0.05 for volatiles, semi-volatiles and SPCC criteria. Quanterra uses less than 0.3 for volatiles SPCC criteria. My observations have been:
 - a. Poor performance for water miscible volatiles generally has occurred when the target volatiles RRF has been less than 0.05. Certain volatiles (acrolein, acetonitrile, etc.) will never have a RRF greater than 0.05. Acrylonitrile and acetone exhibit borderline behavior. The 0.05 criteria is reasonable.
 - b. The first internal standard used for volatiles (bromochloromethane or pentafluoromethane) can have low response causing a larger RRF than calculated from other internal standards.
 - c. The Quanterra lab evaluation report identified organic compounds that will not, or may not, meet the 0.05 RRF criteria. Four or five Appendix IX organic compounds may not be detectable at all.

The following minor items should be considered by ESI. ESI should have no problems with them.

1. The ESI SOP for sulfide considers sample distillation for sulfide. Quanterra will be separating sulfide by precipitation with zinc hydroxide. The ESI and Quanterra analytical methods are different.
2. The ESI SOPs discuss calibration factors for initial calibrations in Methods 8080 and 8150. Quanterra uses a second order regression for initial calibration of single component compounds in Methods 8080 and 8150. Quanterra uses calibration factors for Aroclors, tech.chlordane, and toxaphene in Method 8080. ESI is familiar with second order regression behavior.

cc: K. Hillig, BASF

COPY

April 18, 1996

DRE-8J

Mr. Bruce Roberts
BASF Corporation
1609 Biddle Ave.
Wyandotte, MI 48192

RE: BASF's Submittal of April 12, 1996

Dear Mr. Roberts:

The United States Environmental Protection Agency (U.S. EPA), Region 5, has received and reviewed your submittal dated April 12, 1996. Our comments are as follows:

1. A 30 day extension for the submittal of the reminder of the information is granted. The due date is now May 20, 1996.
2. BASF Corp-RFI-QAPP, Revision 1, April 12, 1996, Section 4, Page 7: Delete the third sentence, "Samples may be held for longer periods . . . ". This is not acceptable.
3. Cyanide Analysis: It is our understanding that QES had also previously identified analysis by the Inorganic Lab to be problematic, and that QES will be proposing an alternative for cyanide analysis outside of the Prussian Blue area to Mr. David Payne of U.S. EPA, and BASF, within the next few days.
4. Prussian Blue Area: On April 15, 1996, Mr. Payne transmitted a copy of a Memorandum with enclosed technical information on Prussian Blue/Cyanide analysis to myself, Kathy Hillig of BASF, and Tom Hymes of QES. Mr. Payne will continue to work with you, Ms. Hillig, Mr. Hymes and I, to develop an acceptable sampling and analytical approach for the Prussian Blue area. Our hope is to have a workable approach for the sampling and analysis of this area by the end of July 1996.

I look forward to receipt of the revised field schedule, as well as implementation of field activities. If you have any questions and concerns, please contact me at (312) 886-6199.

Respectfully,


Diane M. Sharrow

cc: R. Blayer, MDEQ Lansing
J. Russell, MDEQ Livonia
L. Aubuchon, MDEQ Livonia
D. Payne, USEPA-WPTD
M. DeRosa, USEPA-WPTD

bcc: P. Little/Section File

April 12, 1996

RECEIVED

APR 15 1996

**OFFICE OF RCRA
WASTE MANAGEMENT DIVISION
EPA, REGION V**

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (HRE-8J)
77 West Jackson Street
Chicago, Illinois 60604

RE: Response to EPA's conditional approval dated March 11, 1996

Dear Ms. Sharrow:

BASF has revised QAPP Section 9.2.3 as required.

Quanterra Environmental Services (QES) has reviewed the memorandum entitled "Evaluation of Quanterra Environmental Services, North Canton, Ohio, for RFI at BASF Corporation, Wyandotte, Michigan" and has spoken with EPA's Mr. David Payne on several occasions concerning the memo. QES believes that some items in the memo may be considered subjective, but the requirements listed in the "Lab Audit Conditions for QAPP Approval Summary" will be incorporated into QES's SOPs except for cyanide - Prussian Blue areas. It is our understanding that the QES's cyanide procedure is not acceptable.

QES will add an addendum to the Corporate SOPs that will provide the necessary specific facility SOP information. QES will not have these additions and all of the associated changes to the QAPP completed until later this month; therefore, BASF is requesting a 30 day time extension on submitting most of this information to EPA. All of the required modifications to the QES laboratory SOPs will be completed prior to BASF beginning any field work.

QES has completed all of their method validation studies except for hexachlorophene by SW-846 method 8150. QES is currently experimenting with the application of this method for identifying hexachlorophene. QES will be using Update II methods beginning next month.

The QAPP will be revised to list detection limits that are achievable and are specified in QES's SOPs; some detection limits are higher than Act 307 detection limits.

The QAPP will be revised, as required, to incorporate a limited TIC search in the PDC spill area.

Several points of clarification were discussed during a telephone calls between you and BASF's Mr. Bruce Roberts on April 11 and April 12. A summary of the points discussed is:

1. QES's current procedure for cyanide analysis is not acceptable. BASF will require additional guidance from EPA before this issue can be resolved. Since cyanide is to be

analyzed in several wells and soil samples other than in the Prussian Blue area, BASF will not be able to begin field activities until the cyanide issue is resolved.

2. QES's current bottle blank SOP is acceptable to EPA.
3. All of Environmental Standards's data validation SOPs submitted to EPA are acceptable.
4. QES will not be analyzing the physical parameters requiring ASTM or DOT methods; a listing will be sent to EPA for approval.

BASF's Dr. Kathy Hillig and Mr. Bruce Roberts spoke separately with Mr. David Payne today concerning the cyanide issue. Efforts will be made next week to try to resolve the cyanide issue for samples collected outside the Prussian Blue area.

Attached are three copies of revised pages of the QAPP; one set is highlighted to show the changes. Section 9.2.3 has been revised to include the words "back to raw data," TABLE 4-2, page 7 of 7, has been revised by removing sulfide information, and TABLE 1-1, pages 1 and 2, have been revised by updating analytical methods to Update II and deleting sulfide soil analyses information. The deleting of soil sulfide analyses and updating method numbers will also involve revisions to additional pages in the QAPP and will be submitted next month.

Messrs. Bob Veenstra (ESE) and Bruce Roberts will be revising the field schedule and the revised schedule will be sent to you in a few weeks.

Sincerely yours,



Don Yarborough
Wyandotte Site Manager

z:\winword\04126.ltr

cc: B. Roberts - BASF
R. Veenstra - ESE
R. Vitale - ESI
R. Blayer - MDEQ Lansing
L. Aubuchon - MDEQ Livonia
J. Russell - MDEQ Livonia
T. Himes - Quanterra

6. Upon acceptance of the preliminary reports by the QA Officer, final reports will be generated and signed by the Project Manager.

Specific equations used for data reduction are contained in the SOPs in Appendix C.

9.2 DATA VALIDATION

Data validation procedures will be performed for both field and laboratory operations as described in the following subsections.

9.2.1 Procedures Used to Evaluate Field Data

Procedures to evaluate field data for this project primarily include checking for transcription errors and review of field logbooks, on the part of field sampling team. The review will include calibration notes to ensure that calibration was done as defined in SOP-10 and preserved sample pH notes to ensure that adequate preservative was used. This task will be the responsibility of the Field Manager.

9.2.2 Procedures used to Validate Geotechnical Data

Procedures to evaluate data from the geotechnical lab (ASTM methods) include checking for transcription errors, checking that data are plotted on graphs correctly, and review of field logbooks. This task is the responsibility of the RFI consultant QAM.

9.2.3 Procedures to Validate Laboratory Data

Validation of the analytical data (100% back to the raw data) will be performed by the Data Validation Manager or designee using confidential SOPs developed by Environmental Standards, Inc. that were written specifically for USEPA Region V guidelines and qualifier codes. Data validation to include two areas: (1) compliance to the project-specific methods, the published methods and/or the requirements in the QAPP, and (2) usability based on the USEPA Data Validation Functional Guidelines.

<u>Parameter</u>	<u>Container¹</u>	<u>Preservative²</u>	<u>Established Holding Time³</u>	<u>Minimum Amount of Sample Required</u>
<u>Wet Chemistry</u>				
Cyanide	P,G	Cool, 4°C	14 days	50 g

1. Polyethylene (P) or Glass (G). Although polyethylene or glass may be appropriate for many of the samples, where there is a choice the Laboratory will ship polyethylene containers due to the reduced cost of the containers and shipping. The following containers are available upon request: 100 ml widemouth glass with TFE liner; 250 ml widemouth glass with TFE liner; and 500 ml widemouth glass with TFE liner.
2. Established holding times for which there is no specific guidance follows the guidelines for water holding times.
3. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods of time only if the permittee, or monitoring laboratory, has data on file to show that the specific types of samples under study are stable for the longer time. Some samples may not be stable for the maximum time period listed in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.
4. When any sample is to be shipped by common carrier or sent through the United States mail, it must comply with the Department of Transportation regulations.
5. The holding time for leached solids starts after leaching has been completed.

TABLE 1-1
SUMMARY TABLE OF THE SAMPLING AND ANALYSIS PROGRAM FOR RCRA FACILITY INVESTIGATION
BASF CORPORATION, WYANDOTTE, MICHIGAN

Location	Matrix	Field Parameters ⁽¹⁾	Laboratory Parameters	Analytical Method ⁽⁹⁾	Investigative Samples			Field Quality Control Samples						Rinsate Blanks ⁽³⁾			Blind Duplicates			MS/MSD ⁽⁴⁾			Total Samples
								Field Duplicates ⁽²⁾			Trip Blanks												
					No.	Freq.	Total	No.	Freq. ⁽¹⁰⁾	Total	No. ⁽⁵⁾	Freq.	Total	No.	Freq. ⁽¹⁰⁾	Total	No.	Freq. ⁽¹⁰⁾	Total	No.	Freq. ⁽¹⁰⁾	Total	
Fifteen Perimeter Monitoring Wells RFIMW-1 -> RFIMW-12 RFIMW-22, RFIMW-23 PM1NA	Groundwater	pH, Redox ,Specific Conductance, Temperature, Dissolved Oxygen, Water Level	Volatile Organics, Semivolatile Org., PCBs/Pesticides, Herbicides, Dissolved & Total Metals, Cyanide Sulfide	SW-846-8260A	15	4	60	2	1/10	8	2	4	8	2	4	8	1	1/20	4	1	1/20	4	92
				SW-846-8270B	15	4	60	2	1/10	8	NA	NA	0	2	4	8	1	1/20	4	1	1/20	4	84
				SW-846-8080A	15	4	60	2	1/10	8	NA	NA	0	2	4	8	1	1/20	4	1	1/20	4	84
				SW-846-8150B	15	4	60	2	1/10	8	NA	NA	0	2	4	8	1	1/20	4	1	1/20	4	84
				(7, 8)	15	4	60	2	1/10	8	NA	NA	0	2	4	8	1	1/20	4	1	1/20	4	84
				SW-846-9012	15	4	60	2	1/10	8	NA	NA	0	2	4	8	1	1/20	4	1	1/20	4	84
SW-846-9030A	15	4	60	2	1/10	8	NA	NA	0	2	4	8	1	1/20	4	1	1/20	4	84				
Seven Background Wells RFIMW-24 -> RFIMW-28 P34N, P35N	Groundwater	pH, Redox ,Specific Conductance, Temperature, Dissolved Oxygen, Water Level	Volatile Organics, Semivolatile Org., PCBs/Pesticides, Herbicides, Dissolved & Total Metals, Cyanide Sulfide	SW-846-8260A	7	6	42	1	1/10	6	2	6	12	2	6	12	1	1/20	6	1	1/20	6	84
				SW-846-8270B	7	6	42	1	1/10	6	NA	NA	0	2	6	12	1	1/20	6	1	1/20	6	72
				SW-846-8080A	7	6	42	1	1/10	6	NA	NA	0	2	6	12	1	1/20	6	1	1/20	6	72
				SW-846-8150B	7	6	42	1	1/10	6	NA	NA	0	2	6	12	1	1/20	6	1	1/20	6	72
				(7, 8)	7	6	42	1	1/10	6	NA	NA	0	2	6	12	1	1/20	6	1	1/20	6	72
				SW-846-9012	7	6	42	1	1/10	6	NA	NA	0	2	6	12	1	1/20	6	1	1/20	6	72
SW-846-9030A	7	6	42	1	1/10	6	NA	NA	0	2	6	12	1	1/20	6	1	1/20	6	72				
SWMUE ⁽¹¹⁾ RFIMW-13	Groundwater	pH, Redox ,Specific Conductance, Temperature, Dissolved Oxygen, Water Level	Volatile Organics, Semivolatile Org., PCBs/Pesticides, Herbicides, Dissolved & Total Metals, Cyanide Sulfide	SW-846-8260A	1	1	1	1	1/10	1	1	1	1	1	1	1	NA	NA	0	1	1/20	1	5
				SW-846-8270B	1	1	1	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	4
				SW-846-8080A	1	1	1	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	4
				SW-846-8150B	1	1	1	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	4
				(7)	1	1	1	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	4
				SW-846-9012	1	1	1	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	4
SW-846-9030A	1	1	1	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	4				
AOC-2 RFIMW-15 RFIMW-16	Groundwater	pH, Redox, Specific Conductance, Temperature, Dissolved Oxygen, Water Level	Volatile Organics, Semivolatile Org. Dissolved & Total Metals, Cyanide Sulfide	SW-846-8260A	2	1	2	1	1/10	1	1	1	1	1	1	1	1/20	1	1	1/20	1	7	
				SW-846-8270B	2	1	2	1	1/10	1	NA	NA	0	1	1	1	1	1/20	1	1	1/20	1	6
				(7)	2	1	2	1	1/10	1	NA	NA	0	1	1	1	1	1/20	1	1	1/20	1	6
				SW-846-9012	2	1	2	1	1/10	1	NA	NA	0	1	1	1	1	1/20	1	1	1/20	1	6
				SW-846-9030A	2	1	2	1	1/10	1	NA	NA	0	1	1	1	1	1/20	1	1	1/20	1	6
AOC-5 RFIMW-18, RFIMW-21 PM1NB PM3NB	Groundwater	pH, Redox ,Specific Conductance, Temperature, Dissolved Oxygen, Water Level	Volatile Organics Semivolatile Org.	SW-846-8260A	4	1	4	1	1/10	2	1	1	1	1	1	1	1/20	1	1	1/20	1	10	
				SW-846-8270B	4	1	4	1	1/10	2	NA	NA	0	1	1	1	1	1/20	1	1	1/20	1	9
AOC-9 RFIMW-2 ⁽¹²⁾ , RFIMW-14 TMW-1, TMW-2	Groundwater	pH, Redox ,Specific Conductance, Temperature, Dissolved Oxygen, Water Level	Propylene Glycol Propylene Oxide	SW-846-8015A	4	1	4	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	7
				SW-846-8015A	4	1	4	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	7
All Other Wells E1 -> E15, TMW-3 -> TMW-5 RFIMW-13,17, 19, 20, 21 PM2NA, PM3NA, PM2NB PM1NC, PM2NC, P1NA P2NA, P1NB, P2NB, P3NB P1NC, P2NC, RFIPZ-1	Groundwater	pH, Redox ,Specific Conductance, Temperature, Dissolved Oxygen, Water Level	None	None	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	0
Background Monitoring Wells RFIMW-24 -> RFIMW-28	Soil	PID or FID	Volatile Organics	SW-846-8240B	10	1	10	1	1/10	1	1	1	1	2	1	2	NA	NA	0	1	1/20	1	15
			Semivolatile Org.	SW-846-8270B	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14
			(7)	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14	
			Cyanide	SW-846-9012	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14
			Pesticides/PCBs	SW-846-8080A	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14
Herbicides	SW-846-8150B	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14			
SWMUE	Sediment	PID or FID pH	TCLP Extraction	SW-846-1311	4	1	4	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	NA	NA	0	5
			- Volatile Organics	SW-846-8240B	4	1	4	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	6
			- Semivolatile Organics	SW-846-8270B	4	1	4	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	6
			(7)	4	1	4	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	6	
			- Pesticides	SW-846-8080A	4	1	4	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	6
			- Herbicides	SW-846-8150B	4	1	4	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	6
			- Ignitability	ASTM D93-80	4	1	4	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	NA	NA	0	5

**TABLE 1-1
SUMMARY TABLE OF THE SAMPLING AND ANALYSIS PROGRAM FOR RCRA FACILITY INVESTIGATION
BASF CORPORATION, WYANDOTTE, MICHIGAN**

Location	Matrix	Field Parameters ⁽¹⁾	Laboratory Parameters	Analytical Method ⁽⁹⁾	Investigative Samples			Field Quality Control Samples						Rinsate Blanks ⁽³⁾			Blind Duplicates			MS/MSD ⁽⁴⁾			Total Samples			
								Field Duplicates ⁽²⁾			Trip Blanks															
			No.		Freq.	Total	No.	Freq. ⁽¹⁰⁾	Total	No. ⁽⁵⁾	Freq.	Total	No.	Freq. ⁽¹⁰⁾	Total	No.	Freq. ⁽¹⁰⁾	Total	No.	Freq. ⁽¹⁰⁾	Total	No.		Freq. ⁽¹⁰⁾	Total	
SWMU F	Soil	PID or FID	Spontaneous Comb.	49CFR 173 APPX. E	10	1	10	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	10
			Volatile Organics	SW-846-8240B	10	1	10	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	10
			Semivolatile Org.	SW-846-8270B	10	1	10	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	10
			Metals	(7)	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			Cyanide	SW-846-9012	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			Pesticides/PCBs	SW-846-8080A	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			Herbicides	SW-846-8150B	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			pH	SW-846-9045C	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
SWMU G	Soil	PID or FID	Volatile Organics	SW-846-8240B	10	1	10	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	10
			Semivolatile Org.	SW-846-8270B	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			Metals	(7)	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			Cyanide	SW-846-9012	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			Pesticides/PCBs	SW-846-8080A	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
			Herbicides	SW-846-8150B	10	1	10	NA	NA	0	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	12			
SWMU H	Soil	PID or FID	Volatile Organics	SW-846-8240B	10	1	10	1	1/10	1	1	1	1	2	1	2	NA	NA	0	1	1/20	1	15			
			Semivolatile Org.	SW-846-8270B	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14			
			Metals	(7)	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14			
			Cyanide	SW-846-9012	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14			
			Pesticides/PCBs	SW-846-8080A	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14			
			Herbicides	SW-846-8150B	10	1	10	1	1/10	1	NA	NA	0	2	1	2	NA	NA	0	1	1/20	1	14			
AOC 2 ⁽¹⁴⁾	Soil	PID or FID	Volatile Organics	SW-846-8240B	8	1	8	1	1/10	1	1	1	1	1	1	1	NA	NA	0	1	1/20	1	12			
			Semivolatile Organics	SW-846-8270B	8	1	8	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	11			
			Metals	(7)	8	1	8	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	11			
			Cyanide	SW-846-9012	8	1	8	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	11			
AOC 4 ⁽¹⁴⁾	Soil/Tar	PID or FID	Volatile Organics	SW-846-8240B	2	1	2	1	1/10	1	1	1	1	1	1	1	NA	NA	0	1	1/20	1	6			
			Semivolatile Organics	SW-846-8270B	2	1	2	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	5			
			Metals	(7)	2	1	2	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	5			
			Cyanide	SW-846-9012	2	1	2	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	5			
			Moisture Content	ASTM D2216	2	1	2	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	2			
			Compaction	ASTM D558	2	1	2	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	2			
			Strength	ASTM D2166	2	1	2	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	2			
			BTU Value	ASTM D240	2	1	2	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	2			
AOC 5 RFIMW-7, RFIMW-8	Soil	PID or FID	Volatile Organics	SW-846-8240B	14	1	14	1	1/10	2	1	1	1	1	1	1	NA	NA	0	1	1/20	1	19			
			Semivolatile Organics	SW-846-8270B	14	1	14	1	1/10	2	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	18			
AOC 6 ⁽¹⁴⁾	Soil	PID or FID	Volatile Organics	SW-846-8240B	8	1	8	1	1/10	1	1	1	1	1	1	1	NA	NA	0	1	1/20	1	12			
			Semivolatile Organics	SW-846-8270B	8	1	8	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	11			
			Metals	(7)	8	1	8	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	11			
			Cyanide	SW-846-9012	8	1	8	1	1/10	1	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	11			
AOC 7	Soil		Metals	(13)	11	1	11	1	1/10	2	NA	NA	0	1	1	1	NA	NA	0	1	1/20	1	15			
			Cyanide	SW-846-9012	23	1	23	1	1/10	3	NA	NA	0	1	1	1	NA	NA	0	1	1/20	2	29			
SWMU E RFIMW-13 RFIPZ-1	Groundwater	Water Levels	None	None	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			

4444 1 : 1995
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RE-8J

CERTIFIED MAIL P 188 577 421
RETURN RECEIPT REQUESTED

Mr. Bruce D. Roberts
Project Coordinator
BASF Corporation
1609 Biddle Avenue
Wyandotte, Michigan 48192

RE: RFI Workplan - Conditional QAPP Approval
BASF Corporation - North Works
USEPA ID NO.: MID 064 197 742

Dear Mr. Roberts:

The United States Environmental Protection Agency (U.S. EPA) has completed review of BASF Corporation, Incorporated's (BASF) submittal of October 12, 1995, and BASF's submittal of October 18, 1995. U.S. EPA hereby conditionally approves the BASF QAPP. This conditional approval includes resolution of U.S. EPA's comments on the RFI Workplan (QAPP) that were deferred until a Laboratory Evaluation or Audit of the RFI Laboratory were conducted by U.S. EPA.

The conditions of approval are as follows:

1) Data Validation:

Section 9.2.3 (Procedures to Validate Laboratory Data), first sentence: Change the sentence to read "Validation of analytical data (100% **back to the raw data**) will be performed by the Data Validation Manager or designee..."

2) Incorporation of Lab Audit Comments:

Enclosed is the document "Lab Audit Conditions for QAPP Approval Summary". Enclosed with the summary is the subject memorandum "Evaluation of Quanterra Environmental Services, North Canton, Ohio, for RFI at BASF Corporation, Wyandotte, Michigan". The Memorandum is essentially the laboratory audit evaluation. All

conditions specified in the lab audit conditions document must be addressed by BASF and its contractors prior to "full" implementation of the RFI Workplan/QAPP.

3) Use of Revised/Corporate SOPs:

It is U.S. EPA's understanding that the corporate SOPs developed by Quanterra are being revised not only to reflect updates to SW-846, but also for Quanterra's own corporate purposes. U.S. EPA understands the rationale for development of these corporate SOPs. However, these SOPs lack the detail that Region 5 needs to approve corrective action implementation at the North Works. Therefore, there are specific references made to "facility SOPs" in the lab audit summary. This refers to the SOPs submitted from Quanterra's North Canton laboratory and need to be addressed in terms of incorporation of the appropriate SOPs into the QAPP. In addition, U.S. EPA requires all samples taken at the North Works must be analyzed by the Quanterra's North Canton Laboratory, except where agreed to by U.S. EPA (e.g., samples taken from the Prussian Blue areas).

4) Revision of SOP Tables:

All SOP Tables in the QAPP must be reviewed, revised and submitted to U.S. EPA, as appropriate, to reflect U.S. EPA's comments and conditions in these enclosures. For example, even Tables 6-1 (calibration) and 11-1 (preventive maintenance) needs to be modified because graphite furnace methods will not be used for this project.

5) Detection Limits:

U.S. EPA has provided guidance and suggestions in the Enclosure on which of the Michigan "Act 307" detection limits are achievable. U.S. EPA is only requiring BASF to do what is achievable with regards to 307 detection limits, unless otherwise instructed in the Attachment.

6) PDC Spill Area:

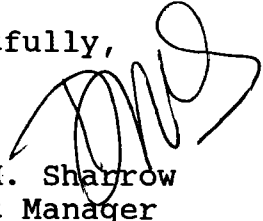
In order to characterize the PDC spill area sufficiently, a limited TIC search protocol should be developed to focus on the metabolites in the spill area. See comment (h) on page 13 of the "Evaluation of Quanterra . . .". document that is attached to the enclosure.

BASF should submit any required items within thirty (30) days of the certified receipt date of this letter.

Mr. DeRosa, Mr. Payne and myself appreciate the cooperation and effort that BASF extended to prepare the October 12, 1995, and October 18, 1995, responses, as well as the cooperation of Quanterra's staff during the Laboratory Audit, and during preparation of the Laboratory Audit Report. I regret the various delays in responding to your submittals, most notably the two government furloughs.

If you have any questions or concerns regarding this letter or the enclosed comments, do not hesitate to contact me at (312) 886-6199.

Respectfully,



Diane M. Sharrow
Project Manager

Enclosure

cc: R. Blayer, MDNR - Lansing
L. Aubuchon, MDNR - Livonia
J. Russell, MDNR - Livonia

bcc: Author
Section File
R. Pallesen, ORC
L. Lodisio, SEMI
M. DeRosa, ECAB
D. Payne, WPTD

Lab Audit Conditions for QAPP Approval Summary

A. QAPP approval is given for the following:

1. Appendix IX semivolatiles (Method 8270 Facility SOP) and Pesticides/PCBs (Method 8080 SOP LM-WALN-4060) used in conjunction with sample preparation of soils/water (SOP CORP-OP-0001). The corrective actions recommended for Method 8270 are minor, by nature, and do not affect the approval/disapproval of this test procedure. Corrective actions recommended for Method 8270 are specified in the lab audit report and are easy to implement.
2. Mercury in soil/water.
3. Sulfide in water.
4. Method 8015 for propylene oxide on soil/water.
5. Method 8015 for propylene glycol in soil/water.

B. QAPP approval is given with conditions for the following:

1. Appendix IX Volatiles (Method 8240 - Soil) and Appendix IX Volatiles (Method 8260 - Water).

CONDITIONS:

- a) Update Tables in the two Facility SOPs, as described in the attached Report ("Evaluation of Quanterra Environmental Services, for RFI at BASF Corporation in Wyandotte, Michigan).
- b) Volatile data packages should contain experimental reference spectra appropriate for data validation.
- c) Quanterra should re-evaluate standard concentrations being used for water miscible volatiles in both 5 ml and 25 ml sample aliquots. Standard concentration changes should be reflected in updated Tables of two Facility SOPs.
- d) SOPs should establish conditions to obtain appropriate experimental mass spectra for acrolein, acetonitrile, propionitrile and dibromochloropropane.

2. Appendix IX Metals (soil/water).

CONDITIONS:

- a. ICP Method 6010A and ICP Trace Method 6010A will be used

for metals (SOP NC-MT-006). As a minimum the ICP Trace will be used for As, Pb, Se, Tl and Sb in water, and As, Se, Tl and Sb in soils. The attached lab audit report further discusses the two instruments.

b. Soils for mercury, cyanide and metals will be dried/homogenized prior to sample preparation by Facility SOPs.

c) QAPP Tables will need to be rewritten to reflect use of SOP NC-MT006.

d) NIST SRM Soils Numbers 2709, 2710, and 2711 will be used to demonstrate appropriate accuracy for soils of both ICP Method 6010A and ICP Trace. See the lab audit report for more information.

3. Appendix IX Herbicides (Method 8150).

CONDITIONS:

a) Establish acceptance criteria for surrogate spike recoveries.

b) Decrease, as appropriate, the concentrations used for surrogate and matrix spikes.

4. Alternative Methods are proposed for the following compounds:

a) 1,4 Dioxane (Method 8270).

b) Hexachlorophene (Method 8150).

5. Cis 1,2-dichloroethene and α -chlordane and γ -chlordane should be reported with Appendix IX results.

6. Other alternative methods are discussed in the attached Report. Aramite and p-phenylene diamine can be reported as "not detectable". The nine organophosphorus pesticides (OPP) compounds can be deleted from the QAPP.

C. The following test procedures are not acceptable, and are discussed in the attached lab audit report:

1. Sulfide in soil - This soil parameter may be deleted from the RFI.

2. Cyanide - Prussian Blue areas. Additional information will be provided to BASF in the near future.

3. SOP CORP-GC-0001, and Appendix A to CORP-OP-0001, for Method 8150. The facility SOPs will be utilized.

4. SOP CORP-MT-0003 for graphite furnace atomic absorption. All of these SOPs will be deleted as this instrument will not be utilized for this project.

*homologation
as perhums to
metals.*

REVISED BASF QAPP COMMENTS 02/05/96

*I need an approval w/ condition
② Wrap this up for spring field work
③ Pertain to SPS
④ Generation 5 Absolute
for
Appendix*

I. PROJECT DESCRIPTION

A. Section 1.5.1 (Groundwater Investigation): The phrase "following method in USEPA 1986" is not clear. Revise Task 8 (page 32 of 71) for clarity, to provide the reference for the document.

B. Section 1.5.6 (SWMU E - Polyols Pond): Revise Table 1-1, Section 1.5.6 and Task 2 as follows: For sediment sampling, collect two discrete samples from each pond along the center line of flow. One sample should be at the head end, the other sample at the tail end. All four samples should be sent to the laboratory for the analyses specified in the March 1995 QAPP. Wells RFIMW-1 and 13 should be moved closer to the pond. RFIPZ-2 should be moved south to be utilized for the groundwater extraction system evaluation. Eliminate RFIPZ-1, 3 and 4. Well RFIMW-13 should be analyzed once, and RFIMW-22 should be analyzed quarterly for Appendix IX constituents.

C. Sections 1.5.7 (SWMU F - Filter Cake Disposal Area) and (SWMU G - Two Nominal Rubble Storage Areas): Representative samples of all materials should be analyzed for Appendix IX rather than the TCLP.

D. Section 1.5.9 (SWMU H - Emergency Containment Pond):

1. It is indicated that, from the subsurface screening, the concentration range of the propylene dichloride (PDC) was found to be up to 10,000 ppm in soil. It was not clear whether the reported value was for one of the PDC isomers or for the sum of all of the isomers. BASF should look for TICs associated with 1,2 PDC.

2. Task Number 5 indicated that soil boring will be advanced to a depth of 20 feet. However, it was not clear how samples for the laboratory analysis will be selected from the 20-foot soil column. The QAPP should be clarified to specify sampling strategy and depth.

3. The pond was not lined, and though it was dredged periodically, there is potential for the contaminants to reach groundwater. The entire open drainage system was operated under BASF's NPDES permit. The contaminants that were required to be monitored under the NPDES permit should be included, and it should be stated whether they are on the Appendix IX list.

E. Section 1.5.15 (AOC 6 - Tar Area (South End)): The coal tar area was not lined and there is potential for coal tar constituents to migrate into the surrounding soil as well as groundwater. The boundary of the buried coal tar area must be defined to determine the horizontal and vertical soil contamination and the impact on groundwater. BASF should modify the QAPP by adding a bullet 8 that explains they will move boring activities outward or horizontally if contamination is still found.

F. Section 1.5.16 (AOC 7 - Prussian Blue Area): BASF should analyze for the full Appendix IX list of metals; i.e., all ICP Method 6010 metals, and

revise the discussion of this area to clarify the placement of monitoring wells.

II. PROJECT ORGANIZATION AND RESPONSIBILITY

ESE should be identified as the party responsible for field collections and field screening and measurements.

III. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION, ACCURACY, COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY

A. QAPP Section 3:

1. The method detection limit and/or the sensitivity of the instrument for each analyte of concern should be specified. A reference to Table 7-4 would be acceptable.

2. QC samples should include reagent blanks, field blanks and trip blanks (for VOC analysis only). This section of the QAPP should be modified to reference where this information can be found (Section 8) as well as the frequency of analyzing these QC samples.

3. For the collection of trip blanks for VOC analysis, it should be specified that one trip blank consists of two 40-ml vials.

IV. SAMPLING PROCEDURES

Sample chain-of-custody should be part of the sampling procedure. Chain of custody should be initiated at the time of sample bottle preparation. Bottles prepared at the laboratory should be enumerated.

V. CUSTODY PROCEDURES

Section 5.3 (Final Evidence Files): The content of the evidence file (e.g., what type of documents, information and data will be kept in the evidence file?) should be specified, as well as who (e.g., Quanterra) is keeping certain contents.

VI. CALIBRATION PROCEDURES AND FREQUENCY

A. Section 6 should be revised to state that the calibration of the specific conductivity meter and the dissolved oxygen meter will be checked after 10 uses. The field SOPs should also be modified accordingly.

B. All applicable QAPP tables should be revised to include the missing information for the analysis of propylene glycol and propylene oxide.

VII. ANALYTICAL PROCEDURES

The Laboratory Evaluation Report will find that Laboratory SOPs dated March 1995 are somewhat generic and lacking detail. These SOPs will need to be updated with new method numbers. This Section of the QAPP should

eventually list the titles and numbers of SOPs with or without reference to the generic SW-846 test procedure numbers. The SOPs need to define what is actually being done and need not be like SW-846 except for hazardous waste characteristics (e.g., TCLP). As follow-up to the laboratory evaluation, new SOPs submitted must be reviewed by USEPA.

VIII. INTERNAL QUALITY CONTROL CHECKS

Entire Section does not correspond to Quanterra's Quality Control procedures, but needs to be consistent with these procedures. USEPA is reviewing this Section of the QAPP along with ESI data review criteria/data validation.

IX. DATA REDUCTION, VALIDATION, AND REPORTING

SOPs submitted by ESI are being reviewed by USEPA.

X. PERFORMANCE AND SYSTEM AUDITS

CASS no longer exists; please list Mr. David Payne, Waste, Pesticides, and Toxics Division.

XI. CORRECTIVE ACTION

Section 13.1: The second paragraph of Section 13 should be revised to address corrective action for sampling activities.

XII. APPENDIX B - STANDARD OPERATING PROCEDURES FOR FIELD TASKS

A. SOP-01 (Analytical Samples Handling Protocol)

1. Section 2 (Sample Identification): "Sample Type" is redundant to "Sample Matrix" and should be deleted.

2. Section 3.0 (Sample Containers and Preservation): Quanterra should modify the SOP for container preservation, and a copy should be given to U.S. EPA by BASF with an indication of whether it is Confidential Business Information.

B. SOP-08 (Surface Soil/Sediment Sampling Procedures)

Section 3.3.4 of SOP 8 should be modified to state that there will be a direct transfer of sample to bottle for volatile analyses.

C. SOP-09 (Drilling and Sampling using An Earth-Probe Rig)

1. Section 5.2, VOCs: SOP 9 should be revised to state that volatile containers will be filled to the top of the container (minimum void).

2. Section 5.3: The SOP heading should be revised by replacing metals with inorganics.

D. SOP-10 (Field Measurements of Groundwater Field Parameters)

The QAPP and field SOP should be revised to add the procedure for continuing calibration check for pH measurement.

E. SOP-15 (Pond Sediment Sampling Procedure) and SOP-16 (Surface Water Sampling procedure):

SOP 8 should be revised to state that there will be a direct transfer of sample to the bottle for volatile analyses.

F. SOP-18 (Groundwater sampling):

SOP 18 should be revised to state that the pH of the preserved sample will be checked and adjusted if necessary.

G. SOP-19 (Field Data Recording and Management Procedures):

The revisions in SOP 18 should be reflected in SOP 19 (record the information of sample preservation in the field logbook and/or the field note sheets).

XIII. APPENDIX C - STANDARD OPERATING PROCEDURES FOR LABORATORY TASKS

A. A percent solids (or percent moisture) SOP should be included in next QAPP. The QAPP and SOP should note all results (solids) should be reported on a dry weight basis, along with percent solids (percent moisture) results.

B. Analytical methods for the analysis of propylene oxide and propylene glycol were not in the QAPP, but were provided at the July 20, 1995 meeting. Please provide additional copies with your response to these comments.

C. Comment on DBC.

D. Before performing the soil sonication for SVOA7 analysis, the pH of the soil needs to be taken. If the pH is above 10, no target acid compounds or surrogates will be recovered for the sample.

E. Section 1 - Add the following sentence at the end of the third paragraph: "Any nonconformance which affects data quality will be brought to the immediate attention of the USEPA Project Manager."

F. Sample Receiving - Section 4.1.1.6: The SOP must be revised to include checking samples for proper preservation and recording such checks at the time of sample receiving.

G. Analysis of Water and Soil Samples for Metals by ICP

1. The detection limit for metals is being rethought by EPA. The Laboratory needs to provide SOP for the ICP trace instrument.

2. The SOP should include the usable concentration range for each metal.

H. GC/MS Semivolatile Organic Compounds/Capillary Column Techniques (Based on Method 8270)

*1. Certain Appendix IX compounds will have percent differences in continuing calibration standard of greater than 30 percent and should be identified. ESI data validation procedures will be reviewed by USEPA in this context.

*2. The mean response factor (from initial calibration) may be used to calculate target analytes when its RSD is less than 15 percent. Alternatives need to be considered if greater than 15 percent, in conjunction with ESI data validation.

3. Aniline and n-nitrosodimethyl amine are listed as SVOA analytes for the site, but is not listed as analytes in the SVOA methods. The applicable QAPP table must be revised accordingly.

4. (Act 307 Question) For groundwater samples, the reporting limits for the following compounds are above the targeted quantitation limits listed in Table 7-4 of the QAPP. A detailed explanation on how the laboratory plans to meet these lower targeted quantitation limits listed in the QAPP needs to be submitted.

<u>Compound</u>	<u>QAPP Target Reporting Limit</u>	<u>Method Reporting Limit</u>
Acenaphthene	5µg/L	10µg/L
Acenaphthylene	5µg/L	10µg/L
Anthracene	5µg/L	10µg/L
Benzo(a)anthracene	5µg/L	10µg/L
Benzo(b)fluoranthene	5µg/L	10µg/L
Benzo(k)fluoranthene	5µg/L	10µg/L
Benzo(ghi)perylene	5µg/L	10µg/L
Benzo(a)pyrene	5µg/L	10µg/L
bis(2-Chloroethyl)ether	5µg/L	10µg/L
bis(2-Ethylhexyl)phthalate	5µg/L	10µg/L
4-Bromophenol phenyl ether	5µg/L	10µg/L
Butyl benzyl phthalate	5µg/L	10µg/L
Chrysene	5µg/L	10µg/L
Diallate	5µg/L	10µg/L
Dibenz(ah)anthracene	5µg/L	10µg/L
Dibenzofuran	5µg/L	10µg/L
di-n-Butylphthalate	5µg/L	10µg/L
Diethylphthalate	5µg/L	10µg/L
Dimethylphthalate	5µg/L	10µg/L
2,4-Dinitrotoluene	5µg/L	10µg/L
2,6-Dinitrotoluene	5µg/L	10µg/L
Fluoranthene	5µg/L	10µg/L
Fluorene	5µg/L	10µg/L
Hexachlorobenzene	5µg/L	10µg/L
Hexachlorobutadiene	5µg/L	10µg/L
Hexachlorocyclopentadiene	5µg/L	10µg/L
Hexachloroethane	5µg/L	10µg/L
Indeno(123-cd)pyrene	5µg/L	10µg/L
Isophorone	10µg/L	20µg/L
Isasafrole	5µg/L	10µg/L
2-Methylnaphthalene	5µg/L	10µg/L
Naphthalene	5µg/L	10µg/L
Nitrobenzene	5µg/L	10µg/L
n-Nitrosodiphenylamine	5µg/L	10µg/L
n-Nitrosodi-n-propylamine	5µg/L	10µg/L
Pentachlorobenzene	5µg/L	10µg/L
Phenanthrene	5µg/L	10µg/L
Pyrene	5µg/L	10µg/L
1,2,4,5-Tetrachlorobenzene	5µg/L	10µg/L
1,2,4-Trichlorobenzene	5µg/L	10µg/L
4-Chloro-3-methylphenol	5µg/L	10µg/L
2-Chlorophenol	5µg/L	10µg/L
2-Methylphenol	5µg/L	10µg/L
2,4-Dichlorophenol	5µg/L	10µg/L
2,4-Dimethylphenol	5µg/L	10µg/L
Phenol	5µg/L	10µg/L
2,4,6-Trichlorophenol	5µg/L	10µg/L

Act 307 is inconsistent with Table 7-4. These reporting limits must be revised to match the laboratory SOPs.

*5. The acceptance criteria specified for phthalate in method blank was unacceptable if Project Objectives require phthalate action levels less than 5 times the reporting limits. Di-n butyl phthalate and bis (2 ethylhexyl) phthalate are the only phthalates to be considered as common lab contaminants.

I. Herbicides based on Method 8150A/8151 (LN-WALN-4110)

*1. The volume of the water sample should be measured in a graduate cylinder. The practice of assuming a density of one for water samples and weighing 500 g of sample is not acceptable.

*2. The acid extraction and hydrolysis clean-up steps are reversed, in order, versus the Method 8150/8151 reference method for solids. The deviation must be justified or the reference method used.

*3. The sample preparation procedure for aqueous samples is a single extraction versus the triplicate extractions detailed in Method 8150B nor Method 8151. The deviation must be justified or the reference method must be used.

4. During solvent concentration, the Snyder column should be prewet with ethyl ether, not acetone or methylene chloride. The SOP should be revised accordingly.

*5. The second order regression provides appropriate initial calibration, but has data validation problems to resolve.

J. GC/MS Volatile Organic Compounds (Method 8240)

1. The SOP must be revised to specify the length of time for vortexing the medium level soil extraction.

2. Certain Appendix IX analytes have relative response factors less than .05; these must be identified and their results so validated by ESI.

*3. Those analytes with continuing calibration percent differences greater than thirty percent will need to be identified.

4. A mean response factor may be used for analyte quantification if its percent RSD is less than 15%. If RSD is greater than 15%, alternative calibrations need to be considered in conjunction with ESI data validation.

5. Methyl ethyl ketone is listed as target analytes in the QAPP, but is not listed in the volatile SOP. The SOP must be revised accordingly.

6. Reporting limits for the following compounds are above the targeted quantitation limits listed in Table 7-4 of the QAPP. The TRLs should be raised to what the laboratory states in the SOPs, or Project Objectives or Act 307 Target MDLs need to be revised for water miscible volatiles.

<u>Compound</u>	<u>Method Reporting Limit</u>	<u>Target Reporting Limit</u>
Acrolein	100µg/L	10µg/L
Acrylonitrile	50µg/L	10µg/L
2-Chloro-1,3-butadiene	100µg/L	10µg/L
trans-1,4-Dichloro-2-butene	5µg/L	1µg/L
1,4-Dioxane	1000µg/L	500µg/L
Ethyl methacrylate	100µg/L	10µg/L
Isobutyl alcohol	1000µg/L	500µg/L
Methyl methacrylate	5µg/L	1µg/L
1,4-Dioxane	1000µg/kg	500µg/Kg
Acrylonitrile	50µg/kg	100µg/kg

7. The spike level of surrogate compounds used (e.g., addition of x ul of this surrogate standard into 5 ml of sample will yield a concentration of y ug/L.) must be specified.

8. Because of the high pH associated with some areas of this site, the pH of surface water and groundwater samples should be checked for proper preservation before analysis. Any instance of improper preservation should be noted in the sample results, and the SOP must be revised.

K. GC/MS Volatile Organic compounds (Method 8260 for Low Level Water)

See comments XVII.L. Also, the Lab Evaluation found a major rewrite of SOP tables and changes in water miscible volatile reporting limits to be necessary. This awaits further comment in the Lab Evaluation Report.

L. Analysis of Sulfide

SOP for sulfide acceptable for water and not for soils, but sulfide will not be tested for soil, except in AOC 7 (Prussian Blue Area).

M. Cyanide, Automated, Pyridine-Barbituric Acid Method

The cyanide SOP, and its reference methodology, is faulty and inappropriate for AOC 7 (Prussian Blue Area) samples. The cyanide-A parameter, as it is operationally defined, is not acceptable and inappropriate for these same sample types.

N. Organochlorine Pesticide/PCBs (Based on Method 8080 and 8081)

1. Sample extracts should be stored at $4 \pm 2^\circ \text{C}$ to prevent solvent evaporation prior to and after analysis.

2. PCB analysis should be confirmed by a second dissimilar chromatography column. All presumptive identifications and NDs should be confirmed.

3. For solid samples, the reporting limits for the following compounds are above the targeted quantitation limits listed in Table 7-4 of the QAPP. The limit should be raised to what the laboratory states in the SOPs.

Compound	Method Reporting Limit	Target Reporting limit
<i>alpha</i> -BHC	8 $\mu\text{g/kg}$	1.7 $\mu\text{g/kg}$
<i>beta</i> -BHC	8 $\mu\text{g/kg}$	1.7 $\mu\text{g/kg}$
<i>delta</i> -BHC	8 $\mu\text{g/kg}$	1.7 $\mu\text{g/kg}$
Lindane	8 $\mu\text{g/kg}$	1.7 $\mu\text{g/kg}$
Heptachlor	8 $\mu\text{g/kg}$	1.7 $\mu\text{g/kg}$
Aldrin	8 $\mu\text{g/kg}$	1.7 $\mu\text{g/kg}$
Heptachlor Epoxide	8 $\mu\text{g/kg}$	1.7 $\mu\text{g/kg}$
Endosulfan I	8 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
Dieldrin	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
4,4-DDE	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
Endrin	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
Endosulfan II	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
4,4-DDD	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
Endrin aldehyde	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
Endosulfan sulfate	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
4,4-DDT	16 $\mu\text{g/kg}$	3.3 $\mu\text{g/kg}$
Methoxychlor	80 $\mu\text{g/kg}$	50 $\mu\text{g/kg}$
Chlordane	80 $\mu\text{g/kg}$	8.3 $\mu\text{g/kg}$

4. The SOP should be revised to note that the inclusion of heptachlor and chlordane (Technical) in the TCLP spiking solution is not feasible since heptachlor is a constituent of chlordane. Calculating a percent recovery for heptachlor would be impossible.

5. Due to the nature of the site, GPC and sulfur cleanups may need to be performed on many of the soil samples. A procedure for these two cleanups should be included in the QAPP and the SOP. The recovery of DBC surrogate must be defined, and hopefully found to be acceptable, for both of these sample cleanups.

6. Quadratic regressions provide appropriate initial calibrations, but provide problems for data validations by ESI.

0. Graphite Furnace Analysis

*1. Specify the usable concentration range for each metal of interest.

*2. The analytical spike protocol (Appendix II) was not fully acceptable. When Analytical results of Post-digestion spike samples show the presence of matrix effect, Method of Standard Addition (MSA) should be used and the sample reanalyzed.

P. Arsenic and Selenium GFAA (Sample) Preparation

*1. It is not clear whether this SOP was intended for aqueous samples or both the solid and aqueous samples. If the SOP was intended to be used for aqueous, were total or dissolved metals to be determined.

*2. In Section 10.1.4, if it is necessary, sample digestates should be filtered prior to being diluted to volume, and not the other way around.

*3. Homogenization of solids as slag, rubble, fill, etc., will be addressed in the Lab Evaluation Report.

Q. Bottle Blank SOP (NC-QA-002)

1. The SOP must be revised to 1) specify the volume of reagent water or freon used in each bottle blank preparation, and 2) specify that the bottle blank should not contain any analyte of interest exceeding the method detection limit, not the quantitation limit.

XIV. APPENDIX E - STANDARD OPERATING PROCEDURES FOR RESEARCH SERVICES

A. The SOP should be revised to insure that the laboratory chain-of-custody procedures include sample tracking during the sample storage, preparation (e.g., extraction, digestion), sample check-in and check out from sample storage, and sample analysis.

Note: Quanterra's Policy is to use the quantitation limit. Compromise offered by BASF is to buy precertified bottles.

ACT 307 MDL REQUIREMENTS AND APPENDIX IX

1. The following is a abbreviated Act 307 List. Each chemical not required, or not tested by Appendix IX is noted.

Act 307 Type C Cleanup Criteria

NT = No Test or Not Required by
Appendix IX (Comparison w/Appendix
IX in 40 CFR 265)

Acetaldehyde
Acetic acid
Acrylamide
Acrylic acid
Alachlor
Aluminum
Athrazine
Azobenzene
Benzidine
benzoic Acid
Benzyl chloride
bis(2-chloroethoxy)ethane
Boron
Bromobenzene
n-Butanol
n-Butyl acetate
t-butyl acetate
Camphene
Caprolactam
Chloride
2-Chloroethyl vinyl ether (not
detected in acid preserved aliquots)
o-Chlorotoulene
Chloropyrifos
Chromium VI
Cyanazine
Cyanide (free) - no test procedure
exists
Appendix IX includes Total Cn
Cyclohexanone
Dacthal
Diacetone alcohol
Diazinon
cis-1,2-Dichloroethylene
Dichlorovos
Dicyclohexyl phthalate
Diethyl ether
Diethylene glycol monobutyl ether
Diisopropylamine
N,N-Dimethylacetamide
N,N-Dimethylaniline
Dimethylformamide
2,6-Dimethylphenol
3,4-Dimethylphenol
Dimethylsulfoxide
Epichlorohydrin

Ethanol
Ethyl acetate
1-Ethyl-2-methylbenzene
Ethylene glycol
Ethylene glycol acetate
Ethylene glycol monobutyl ether
Fluorine (soluble fluoride)
Formaldehyde
Formic acid
1-Formyl piperidine
Gentian violet
n-Heptane
Hexabromobenzene (Part of PBBs)
n-Hexane
Iron
Isopropyl alcohol
Manganese
Mercury (Inorganic).
Total Hg part of Appendix IX
Methanol
2-Methoxyethanol
2-Methyl-4-chlorophenoxyacetic acid
2-Methyl-4,6-dinitrophenol
N-methyl morpholine
methyl-tert-butyl ether (MTBE)
Methylcyclopentane
4,4-methylene-bis-2-chloroaniline
(N)
Methylene chloride (Lab Contaminant)
Metoalchlor
Molybdenum
Nitrate
Nitrite
Oxo-hexyl acetate
pendimethalin
2-Pentene
Piperidine
polybrominated biphenyls
Prometon
Propachlor
Propazine
Propionic acid
Propyl alcohol
Propylene glycol
Sodium
Sulfate
Tebuthion
Tetrahydrofuran
p-Toluidine (o-Toluidene is part of
Appendix IX)
Triallate
Tributylamine

1,1,2-Trichloro-1,2,2-
 Trifluoroethane
 Triethanolamine
 3-Trifluoromethyl-4-nitrophenol
 Trifluralin
 2,2,4-Trimethyl-2-pentene
 1,3,5-Trimethylbenzene
 tris(2,3-Dibromopropyl) phosphate

Lab Contaminants

Acetone
 Aluminum
 bis(2-ethylhexyl)phthalate
 Boron

From the Act 307 List above, the following chemicals can be readily tested by using test procedures commonly used for Appendix IX.

6010 ICP	8240/8260	8270	8080/8120
Aluminum	Bromobenzene	Benzidine* ¹	Benzyl Chloride
Boron*	o-Chlorotoluene	Benzoic acid*	
Iron	Cyclohexanone	Benzyl chloride	
Manganese	cis-1,2 DCE	bis (2-Chloroethoxy)-ethene	
Molybdenum	Ethyl acetate	Dicyclohexyl-phthalate	
Sodium	1-Et-2MeBenzene	2,6-Dimethyl phenol	
	n-Heptane	3,4-Dimethylphenol	
	n-Hexane	piperidine (?)	
	MTBE	p. Toluidine (stable?)	
	Methylcyclopentane	3-trifluoromethyl-4-nitrophenol	
	2-Pentene		
	THF*		
	Freon 113		
	2,2,4-Trimethyl-2-pentene		
	1,3,5-Trimethyl benzene		

* These four compounds have poor analytical performance. Boron is a lab contaminant from Pyrex glassware (requires Teflon or plastic labware to achieve MDL). THF has poor purging efficiency and has been noted as a contaminant from glue in monitoring well casings (plastic). Benzidine and benzoic Acid are commonly tested by 8270, but have abysmal chromatography and poor sensitivity. Many of the amines and amides listed by Act 307 could be tested by 8270, but I am not sure which ones are nor present.

8150

General Chemistry

2-Me-4 Chloro-phenoxyacetic acid Chloride
Fluoride
Nitrate
Nitrite
Sulfide

The six metals listed above are routinely tested by ICP instrument, as most are necessary for interelemental corrections (Boron is not, but is a common analyte). Four of the metals can be and should be reported (Mo and B are separate issues).

The general chemistry anions - chloride through sulfate - are relatively easy to test in waters.

For methods 8240, 8260 and 8270, the compounds have been listed which can be determined by insertion of authentic compound into calibration standards. This has been observed for most of these compounds for other projects. Quanterra has some of them in their calibration standards, but does not report them as they are not part of Appendix IX. Many of the Act 307 amines and amides would be detected by 8270, but they were not listed because there is no specific information on their extraction and chromatography performance.

Two specific cases should be noted for 8240/8260/8270:

a. cis-1,2-Dichloroethene must be tested in addition to the listed trans isomer of Appendix IX. The cis isomer is the principal degradation product (versus trans isomer) from trichloro and tetrachloro ethanes/ethenes and would be expected in groundwater.

b. Benzylchloride is readily measured at a 5 or 10 ug/l reporting limit by Method 8270. However, a 0.5 ug/l MDL requirement by Act 307 would require use of Method 8120 or 8080.

Act 307 lists one chlorinated phenoxy acetic acid (2-methyl-4-chlorophenoxy acetic acid) which is not listed by Appendix IX. Quanterra SOP for Method 8150 provides for this compound. The compound's acronym is DCAA and is part of method 8150. It can be readily tested. DCAA will be part of the Lab's Report for any sample tested by Method 8150.

SUMMARY:

Cis-1,2-DCE and DCAA are part of Quanterra's present calibration standards and must be reported for the North Works site to meet Act 307 "requirements". Al, Fe, Mn, Sodium, as well as Magnesium must be part of current Method 6010 outputs and will be reported.

The remaining compounds listed above can be reviewed by Project Manager/QAPP

Manager (Sharrow/DeRosa) and BASF to see if they need be tested to meet Act 307 "requirements".

The volatile hydrocarbons - hexane, 2-pentene, etc., are driven by gasoline contamination as well as MTBE. The general chemistry anions can help interpret groundwater results, but may not be contaminants themselves.

2. The following is a listing of contaminants from Section 7, Table 7-4 of the QAPP, which are not part of Act 307 List (Non Act 307) or TQLs are different between Act 307 and Appendix IX.

See Section 7 Pages 8-17.

BASF QAPP Section 7.0 - Listing of Appendix IX Contaminants and the RFI Laboratory Test procedures and TQLs. Table 7-4 BASF CORPORATION, MICHIGAN RFI

Volatiles (8260) - Method will use 25 ml purge of H2O to meet 1 ug/l MDL requirement of Act 307. RFI Laboratory will be redoing Method 8260 because TQLs are too small for water miscible volatiles. TQLs will increase for acetone, acrolein, etc.

Volatiles	TQLS - Water	
Acetone	10 (low)	Act 307 is 50
Acetonitrile	100 (high)	" " 10
Acrolein	10 (high)	" " 5
Acrylonitrile	10 (high)	" " 1
3-Chloro-1-propene	10 (high)	Non Act 307 can be 1 or 2
2-Chloro-1,3-butadiene	1	Non Act 307
1,2-Dibromo-3-chloropropane	20 (high)	" " "
trans-1,4-Dichloro-2-butene	1	" " "
Dichlorodifluoromethane	2 (high)	Act 307 is 1
cis-1,2-Dichloroethene	1 (need trans isomer also)	
1,4-Dioxane	500 (high)	Act 307 is 1
Ethyl methacrylate	1	Non Act 307
2-Hexanone	10 (low)	Act 307 is 50
Methacrylonitrile	20 (low)	Non Act 307
Ethyl ketone	10 (low)	Act 307 is 50
Idomethane	10	Non Act 307
Methyl methacrylate	1	" "
Propionitrile	100	" "
Vinyl acetate	10 (low)	Act 307 is 50

Volatiles (8240A)

Volatiles	TQLS - Soil
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Acetonitrile	50 (low) Act 307 is 100
Acrolein	50 (high) Act 307 is 10
Acrylonitrile	50 (high) Act 307 is 5
3-Chloro-1-propene	50 (high) Non Act 307
	Should be 10
2-chloro-1,3-butadiene	5 Non Act 307
1,2-Dibromo-3-chloropropane	10 " "
trans-1,4-Dichloro-2-butene	5 Non Act 307
1,2-Dichloroethene, Total	5 (cis +trans ok)
Ethyl methacrylate	5 Non Act 307
Methacrylonitrile	20 (low) " "
Iodomethane	10 Non Act 307
Methyl methacrylate	5 " "
Propionitrile	20 (low) " "

Semivolatiles

Semivolatiles (8270A)

TQLS - Water

Acenaphthene	5 Lab uses 10
Acenaphthylene	5 " "
2-Acetylaminofluorene	20 Non Act 307
4-Aminobiphenyl	50 " "
Aniline	10 " "
Anthracene	5 Lab uses 10
Aramite, Total	50 ND?
Benzo(a)anthracene	5 Lab used 10
Benzo(b)fluoranthene	5 " "
Benzo(k)fluoranthene	5 " "
Benzo(g,h,i)perylene	5 " "
Benzo(a)pyrene	5 " "
bis(2-Chloroethoxy)methane	10 Non Act 307
bis(2-Chloroethyl)ether	5 Lab uses 10
bis(2-Chloroisopropyl)ether	10 Non Act 307
bis(2-Ethylhexyl)phthalate	5 Lab uses 10
	Lab Contaminant
4-Bromophenyl phenyl ether	5 " " & Non At 307
Butyl benzyl phthalate	5 Lab uses 10
4-Chloroaniline	10 Non Act 307
p-Chlorobenzilate	10 " "
4-Chlorophenyl phenyl ether	10 " "
Chrysene	5 Lab uses 10
Diallate, Total	10 Non Act 307
Dibenz(a,h) anthracene	5 Lab uses 10
Dibenzofuran	5 " "
Di-n-butyl phthalate	5 Non Act 307
	Lab uses 10
	Lab Contaminant
Diethyl phthalate	5 Lab uses 10

Dimethoate	200 Non Act 307
7,12-Dimethylbenz(a)anthracene	100 " "
3,3'-Dimethylbenzidine	50 " "
alpha, alpha-dimethyl	50 " "
Dimethyl phthalate	5 " "
	Lab uses 10
1,3-Dinitrobenzene	10 Non Act 307
2,4-Dinitrotoluene	5 Lab uses 10
2,6-Dinitrotoluene	5 " "
Di-n-octyl phthalate	10 Non Act 307
Diphenylamine	10 " "
Ethyl methanesulfonate	10 " "
Fluoranthene	5 Lab uses 10
Fluorene	5 " "
Hexachlorobenzene	5 H2O and 330 soil - Bridge to Cross
	.1 or 10 - Lab uses 10 H2O
Hexachlorobutadiene	" "
Hexachlorocyclopentadiene	" "
Hexachloroethane	" "
Hexachloropropene	100 Non Act 307 (?)
Indeno(1,2,3-cd)pyrene	5 Lab uses 10
Isosafrole, Total	10 Non Act 307
Methapyrilene	100 " "
3-Methylcholanthrene	100 " "
Methyl methanesulfonate	10 " "
2-Methylnapthalene	5 Lab used 10
Napthalene	5 Lab uses 10
1,4-Naphthoquinone	Non Act 307
1-Napthylamine	" "
2-Napthylamine	" "
2-Nitroaniline	" "
3-Nitroaniline	" "
4-Nitroaniline	" "
Nitrobenzene	5 Lab uses 10
4-Nitroquinoline-1-oxide	Non Act 307
N-Nitrosodi-n-butylamine	" "
N-Nitrosodidiethylamine	" "
N-Nitrosodimethylamine	" "
N-Nitrosodiphenylamine	5 Lab uses 10
N-Nitrosodi-n-propylamine	" "
N-Nitrosomethylethylamine	Non Act 307
N-Nitrosomorpholine	" "
N-Nitrosopiperidine	" "
N-Nitrosopyrrolidine	" "
5-Nitro-exeluidine	" "
Pentachlorobenzene	5 Lab uses 10
	307 is 0.5 for water
	330 for soil
	307 is 50 for soil
Pentachloroethane	Non Act 307

Pentachloronitrobenzene	50 Lab uses 10
	307 is 0.1 for water
	1600 for soil
	307 is 50 for soil
Phenacetin	Non Act 307
Phenanthrene	5 Lab uses 10
p-Phenylene diamine	50 Lab uses 10
	ND? for water
	1600 ND? for soil
Phorate	Non Act 307
2-Picoline	Non Act 307
Pronamide	Non Act 307
Pyrene	5 Lab uses 10
Safrole, Total	Non Act 307
1,2,4,5-Tetrachlorobenzene	5 Lab uses 10
	307 is 0.1
	Bridge to cross 0.1 or 5
0-Toluidine	Non Act 307
1,2,4-Trichlorobenzene	5 Lab uses 10
	307 is 0.1
	Bridge to cross 0.1 or 5
1,3,5-Trinitrobenzene	Non Act 307
4-Chloro-3-methylphenol	5 Lab uses 10
2-Chlorophenol	" "
2-Methylphenol	" "
*3-Methyphenol	10 307 is 5
*4-Methyphenol	" "
*These two compounds should be reported "either/or"	
2,4-Dichlorophenol	5 Lab uses 10
2,6-Dichlorophenol	Non Act 307
2,4-Dimethyphenol	5 Lab uses 10
2,4-Dinitrophenol	Non Act 307
4-Nitrophenol	" "
Phenol	5 Lab uses 10
2,4,6-Trichlorophenol	" "
Pentachlorophenol	50 Lab uses 10
	307 is 1
Pentachlorophenol also tested by RFI Lab by method 8150 (see below)	
2,3,4,6-Tetrachlorophenol	Non Act 307

PESTICIDES (8080)

	<u>Water</u>	<u>Soil</u>
alpha-BHC	0.05 307 is 0.01	1.7 Lab uses 8 mg/kg
beta-BHC	" "	" "
delta-BHC	Non Act 307	" "
Lindane	0.05 307 is 0.01	" "
Heptachlor	" "	" "
Aldrin	" "	" "
Heptachlor epoxide	" "	" "

Endosulfan I	"	"	3.3 Lab uses 8 mg/kg
Dieldrin	0.1 307 is 0.02	"	3.3 Lab uses 16 ug/kg
4,4'-DDE	"	"	"
Endrin	"	"	"
Endosulfan II	"	"	"
4,4'-DDD	"	"	"
Endrin aldehyde	Non Act 307	"	"
Endosulfan sulfate	"	"	"
4,4'-DDT	0.1 307 is 0.02	"	"
Methoxychlor			50 Lab uses 80 ug/kg
Chlordane	0.5 307 is 0.02		8.3 Lab uses 80 ug/kg
Kepone	Non Act 307		
Isodrin	"	"	
Methyl parathion	"	"	
Parathion	"	"	
Aroclor-1016	0.5 307 is 0.2		
Aroclor-1221	"	"	
Aroclor-1232	"	"	
Aroclor-1242	"	"	
Aroclor-1248	"	"	
Aroclor-1254	1 307 is 0.2		
Aroclor-1260	"	"	

HERBICIDES (8150A)

2,4-D	0.5 307 is 10
2,4,5-TP (Silvex)	0.1 307 is 1
2,4,5-T	Non Act 307
Dinoseb	0.7 307 is 1
Pentachlorophenol	0.1 307 is 1

NONHALOGENATED VOLATILES (8015)

Units are incorrect in table for this Method

Direct Injection

Acetonitrile	1 ug/L and should be 1000 ug/l
Acrolein	"
Acrylonitril	"
1,4-Dioxane	"
Propylene Glycol	10?
Propylene Oxide	ND?

Azeotrope Distillation

1,4-Dioxane	0.05 ug/L and should be 50 ug/l
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METALS - Does not include Al, Fe, Mn, B, Na of Act 307

ICP METALS (6010A)

	Water	Soil
Antimony	0.3 307 is 0.005	30 307 is 0.5
Barium	0.01 " 0.20	1 " 1.0
Beryllium	Non Act 307	
Chromium, Total (Cr III of 307)	0.02 307 is 0.050	2 307 is 2.5
Cobalt	Non Act 307	
Copper	0.01 307 is 0.025	1 307 is 1.0
Nickel	0.04 " 0.050	4 " 1.0
Tin	Non Act 307	
Zinc	0.02 307 is 0.02	5 307 is 1.0
Vanadium	0.02 "	5 "

ICP TRACE METALS (6010A)

(No SOP in QAPP)

	Water	Soil
Antimony		0.5 307 is 0.10
Arsenic	0.005 307 is 0.001	" "
Cadmium	0.001 " 0.0002	0.1 " 0.05
Chromium, Total	0.005 " 0.050	0.5 " 2.5
Lead		0.3 " 1.0
Selenium		
Silver	0.005 " 0.0005	
Thallium	0.01 " 0.002	1.0 " 0.30

FURNACE/COLD VAPOR METALS

	Water	Soil
Arsenic (7060A)		0.5 307 is 0.010
Lead (7421)		0.3 " 1.0
Mercury (7470)		
Mercury (7471A)		
Selenium (7740)		
Silver (7761)		
Thallium (7841)		1.0 " 0.5

INORGANIC PARAMETERS

	Water	Soil
Cyanide (9012A)	0.005 307 is 0.005	0.25 307 is 0.20
Sulfide (9030A)	Non Act 307	

Constituents listed above are where Quanterra's RLs are larger than Act 307 Target MDLs. There are also a few that are significantly smaller. After discussions with Quanterra, two general differences are noted, besides specific ones discussed earlier.

a. Semi-Volatiles (Water) Method 8270

All unmarked TQLs of Table 7-4 for water are the same as Act 307. Quanterra actually used a RL of 10 ug/l instead of 5 ug/l. See QAPP Review Comment XIII. I?5 for a specific list. The 10 ug/l is reasonable, but I do not know how difficult it would be to lower to 5 ug/l.

b. Pesticides (Water and Soil) Method 8080

There is a difference between Quanterra's RL and Act 307. The pesticides listed in the QAPP Review Comment XIII. 0?. are five times larger than Act 307 TQLs or MDLs. Table 7-4 does not reflect Quanterra's actual operations.

SUMMARY:

Section 7 of the QAPP indicates that the TQLs of Table 7.4 will be used for the RFI. The TQLs appear to be the same as Act 307 for many chemicals. In the case of method 8270 (water) and certain pesticides by Method 8080 (water and soils), Quanterra's RL may be twofold and fivefold larger. This may not be sufficient.

3. Major MDL Problems of Act 307

There are four major problems with the MDLs required by Act 307:

a. Common Lab contaminants

The following chemicals are commonly noted in lab blanks, prep. blanks, field blanks, or are part of lab reagents/standards:

acetone
aluminum (20 ug/l MDL - dust, glassware)
boron (pyrex glassware)
Methylene Chloride (extraction solvent for 8080 and 8270)
Di-n-Butylphthalate
b(c)is (2-ethylhexyl) Phthalate
Methanol (not Appendix IX)
Freon 113 (oil and grease extraction solvent - not Appendix IX)

Act 307 provides MDLs that may be difficult to achieve for the above eight compounds because they are lab contaminants found in samples, blanks and standards. Site specific needs must be specified and balanced with costs of reducing lab contaminant concentrations.

b. Acetonitrile, Acrylonitrile, Acrolein and 1,4-Dioxane have Act 307 MDLs of 10, 1, 5 and 1 ug/l respectively. By whatever test procedure used (8240 or 8260) the following reporting limits are achievable:

Acrylonitrile 10-20 ug/l
Acrolein 50-100 ug/l
Acetonitrile 100-200 ug/l

Act 307 is incorrect for these two test procedures. These are water miscible volatiles. Their poor purging efficiencies preclude detection limits less than the above values.

1,4-Dioxane has a MDL requirement of 1 ug/l. This is impossible by Method 8240/8260. Table 7-4 provides 500 ug/l. which is reasonable. To achieve 1 ug/l, a specialized test procedure is required for 1,4-Dioxane.

c. Act 307 provides a footnote "W" for certain chlorinated hydrocarbons: hexachlorobenzene, hexachlorobutadiene, hexachloroethane, hexachlorocyclopentadiene. The "W" symbol provides for either Method 8120 (detection limits of .1 ug/l or less) or Method 8270 (reporting limit of 5 or 10 ug/l) to be used. The use of one or the other is site specific.

Act 307 is "goofy" in that pentachlorobenzene and pentachloronitrobenzene have MDL requirement of .5 ug/l and .1 ug/l respectively. These appear less important than the above four compounds. If Method 8120 is to be used for the latter two compounds then the other four compounds would be part of Method 8120. Presently, Method 8270 will be used for all six (See Table 7-4). the decision on which Method to use is up to Project Manager, in conjunction with MDEQ and BASF. The use of 8120 or 8270 is probably the most difficult decision to make, in this memo, for the BASF site.

d. Most laboratories test metals in soil by Digestion Method 3050 followed by ICP Method 6010. Special test procedures (GFAA) are commonly used for As, Se, Tl and optionally Pb. The MDLs of Act 307 are unusually low (relative to other programs) for certain metals causing short cuts to be taken by Laboratories for Act 307 metals in soil. The following metals (soils) and their MDLs are listed below, with the corresponding metal concentrations in soil digest by Method 3050 in parentheses.

<u>Metal</u>	<u>307MDL</u> mg/kg or ppm	
Aluminum	00.5	(5 ug/l)
Antimony	00.5	(5)
Arsenic	00.1	(1)
Barium	1.0	(10)
Boron	2.0	(20)
Cadmium	00.05	(.5)
Chromium	2.5	(25) "Easily Done"
Copper	1.0	(10) "Borderline"
Iron	2.0	(20)
Lead	1.0	(10) "Easy by GFAA"
Manganese	2.0	(20) "Easily Done"
Nickel	1.0	(10)
Selenium	0.5	(5)
Sodium	NA	(NA)
Thallium	0.5	(5)
Vanadium	1.0	(10)
Zinc	1.0	(10)

Using ICP Method 6010, a wide distribution of metals results will be obtained

for soils at a site such as BASF. The required MDLs would not be met for all ICP metals. Using graphite furnace atomic absorption for many ICP metals will probably not markedly improve data usability. The Project Manager's (Sharrow) suggestion for use of the sensitive methods for Sb, Cd, Pb and Ni has merit.

The following metal MDLs (water) from Act 307 are unusually low (versus other programs):

Aluminum	20.0	ug/l
Antimony	5.0	"
Arsenic	1.0	"
Cadmium	0.2	"
Silver	0.5	"

Sb, As and Cd can be done by GFAA in a borderline manner. The MDLs specified for Al and Si appear unreasonable and a waste of money. Quanterra has difficulty with .2 for Cd, but can meet .5 ug/l on a routine basis.

6. The following chemicals have specific MDL problems created by Act 307.

a. Al and Si (water) and Al, As and Sb (soil) - see discussion above.

b. Chlordane (water). Chlordane cannot be detected at .02 ug/l using Method 8080.

c. Dinoseb and pentachlorophenol (water) - These two phenolic compounds have MDLs of 1 ug/l in Act 307. The compounds can be detected at 1 ug/l using Method 8150, while many labs test for them by Method 8270 with DLs of 10 to 50 ug/l. Quanterra will be using Method 8150 according to QAPP, therefore this is not a problem.

*Duplicate
copy*

BASF

October 12, 1995

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (HRE-8J)
77 West Jackson Street
Chicago, Illinois 60604

RE: Response to EPA's final comments dated August 10, 1995

Dear Ms. Sharrow:

This letter is a response to the another portion of your August 10 comments. BASF will not be able to respond to all of EPA's comments within 60 days as required because of the items to be addressed in the laboratory audit. BASF requests additional time to respond because BASF has not yet received any response from EPA concerning the items being addressed in the laboratory audit.

Below is a brief summary of the revisions to portions of the QAPP as required by (1) your letter dated August 10, 1995, (2) typographical errors, or (3) minor corrections. Again, enclosed are three sets of partial revisions. One set of revisions has the specific revisions highlighted or paragraphs have been bracketed with highlighter and is grouped by EPA comment number except where noted in parenthesis (lab SOPs have not been sequenced by EPA comment and are not highlighted). The other two sets of revisions are in the same sequence as the current QAPP and are not highlighted.

IV. - Two separate Chain of Custody forms will be used. One will be initiated by Quanterra and will be for the empty bottles; it is not enclosed. The second form will be initiated by ESE and will be for the samples (see field SOP-01).

VI.B. - TABLE 6-1 pages 8, 9, and 10 have been revised to specify which methods Quanterra is presently using; the other pages have the correct methods. The North Canton facility is still using Update I methods for several analyses and plans to switch to Update II methods around the end of November. Some of the corporate SOPs reflect Update II methods. When they switch, the tables and lab SOPs will be revised and submitted to EPA for approval. Page 4 has been revised to correct a typographical error. The entire TABLE 6-1 is enclosed. Pages 5 and 6 did not change except for the relative position of the header; the other pages contain revisions.

VI.C. - TABLE 6-1 pages 7, 8, 9, and 10 have been revised to replace the term "RL" with "PQL". Quanterra uses the term "RL" in

their SOPs; the SOPs will not be revised to replace that term. (with VI.B.)

VI.D. - TABLE 1-1, TABLE 3-1, TABLE 6-1 pages 9 and 10, TABLE 7-2, and TABLE 7-4 page 15 have been revised to include the information for propylene glycol and propylene oxide (TABLE 1-1 was submitted with the September 22 response). TABLE 3-1 has also been revised to correct the recovery limits for the ICP metals, correct method revision numbers, add silver (7761) with limits, and add soil pH. TABLE 7-4 page 15 was also revised to correct a typographical error in the units for method 8015A. Quanterra is still in the process of determining the method detection limits for some of the compounds listed in TABLE 7-4; they will be submitted to EPA when they are available. (TABLE 6-1 is with VI.B.)

VII.A. - TABLE 7-1 reflects the methods that Quanterra is presently using; it will be revised when Quanterra switches to the Update II methods. TABLE 7-1 has also been revised to show a SOP for Total Solids, to revise the sequence of the methods, to correct method number revisions, to show the new Quanterra SOP name, to revise note 1, and to add note 3.

VII.B. - TABLE 7-2 reflects the methods that Quanterra is presently using; it will be revised when Quanterra switches to the Update II methods. TABLE 7-2 was also revised by slightly rearranging some of the items, to correct method number revisions, to add soil pH, and to show the new Quanterra SOP name. (with VI.D.)

VII.C. - TABLE 7-4 pages 15 and 17 have been revised to reflect the method Quanterra is presently using. The other pages did not require modification for method revision numbers. Pages 14 and 15 have been revised by shifting the word "method". (all pages with VI.D.)

VIII. - Open issue; to be addressed with lab audit items.

MISCELLANEOUS - QAPP

QAPP Section 1 pages 59 through 71 have been respaced to allow the addition of a new section 1.5.20 on page 70 entitled Surface Water Runoff. This new section presents the objectives, tasks, and data usage for collecting surface water runoff samples. The existing Sample Summary Table section has been renumbered to section 1.5.21. Page 2 of 6 of the TABLE OF CONTENTS has been revised to reflect these changes.

XII.A.2. - Quanterra will not have to modify any of their laboratory SOPs for container preservation. SOP-01 Section 3 already states that preservatives will be added. Quanterra will add the preservatives to the bottles before they are shipped. Preservatives would be added in the field if something were to happen when a bottle is being filled or if an empty bottle is broken during transport. As specified in our September 22 response, the pH of preserved samples will be checked in the field and adjusted as required.

When BASF changed from Woodward Clyde to ESE, we did not receive an original copy of some of the forms that appear in the field SOPs. We have recreated most of them and they are enclosed. Their appearance is slightly different but, the content is the same. The enclosed forms are: FIELD BORING LOG - SOP-02 and SOP-19; WELL DEVELOPMENT/REDEVELOPMENT LOG - SOP-07 and SOP-19; SURFACE SOIL DATA COLLECTION FORM - SOP-08 and SOP-19; DRUM FIELD LOG FORM - SOP-12 and SOP-19; DATA SHEET - ELECTRICAL RESISTIVITY SOUNDINGS - SOP-13 and SOP-19; and GROUNDWATER SAMPLE COLLECTION FIELD SHEET - SOP-18 and SOP-19.

SOP-21 has been revised by ESE as discussed with you earlier. It and the cover sheet are enclosed. QAPP Section 1 pages 31 and 32, task 7 have been slightly revised to reflect the modified SOP-21. SOP-21 Section 1.0 - the paragraph beginning "The aquifer testing method...." has been eliminated. The last two sentences in the next paragraph have been replaced with a new sentence and two additional paragraphs have been added. Section 3.1 has been expanded. Section 3.1.1 has been revised by adding two sentences at the end of the second paragraph and adding another paragraph. Section 3.1.2 - the last sentence of the second paragraph has been replaced with three sentences. Section 3.2 has been slightly revised. Section 3.3 has been revised by combining the second and third paragraph and adding an additional paragraph. The word "any" has been added in the second sentence of the last paragraph of the text on page 8.

XIII - The revised and updated laboratory SOPs are enclosed. APPENDIX C cover sheet and Standard Operating Procedures Laboratory Work TABLE OF CONTENTS, without page numbers, have been added. They appeared in the June 1994 QAPP but, not in the March 1995 QAPP. Also, please rearrange the laboratory SOPs so that they match the order shown in the TABLE OF CONTENTS. The enclosed SOPs are already in order.

Also enclosed is TABLE A - COMPARISON OF LABORATORY SOPs. It is for clarification purposes only and is not intended to become part

of the QAPP. It lists the March QAPP SOP name and the QAPP Revision 1 SOP name. The SOPs beginning with "CORP" are corporate SOPs, SOPs beginning with "NC" are newer North Canton SOPs, and SOPs beginning with "LM" are older North Canton SOPs.

XIII.A. - Lab SOPs for propylene glycol and propylene oxide are enclosed with the lab SOPs.

XIII.B. - Section 4.2.16 of the updated Sample Receiving SOP (NC-SC-0005) states that the pHs are taken on all preserved samples except for volatiles and the pH is recorded on the cooler receipt form.

XIII.C.1 - Table 3 in the updated corporate SOP CORP-OP-0001 states that Pest/PCB surrogate is DCB/TCX. Based upon my telephone conversation with you on October 10, it is my understanding that EPA will modify its August 10 comments and drop this comment. Therefore, Quanterra will not modify its SOPs LM-WALN-5020 and LM-WALN-5060 at this time. If EPA does not drop this comment, it will be addressed at a later date.

XIII.C.2. - Audit item.

XIII.C.3. - Audit item.

XIII.D.1. - Audit item.

XIII.D.2 - The lab SOP NC-WC-0004, which includes total solids, has been enclosed with the lab SOPs. The total solids of the sample would be determined by an individual in another section of the laboratory and the results would be entered into the lab's computer system. SOP LN-WALN-5060 does not need to be revised. The computer system would calculate the final results on a dry weight basis.

XIII.D.3. - Audit item.

XIII.E.1. - Audit item.

XIII.E.2. - Audit item.

XIII.E.3. - Comment only; no response is required.

XIII.E.4. - Audit item.

XIII.E.5. - Audit item.

XIII.F.1. - The lab SOP NC-WC-0004 which includes total solids has been enclosed. SOP NC-MT-0005 does not need to be revised; again, the computer system would calculate the final results on a dry weight basis. SOP NC-MT-0005 is in the process of being revised to clarify a reference. When it is revised, BASF will submit the revised SOP to EPA.

XIII.F.2. - Audit item.

XIII.G.1. - Audit item.

XIII.G.2. - Audit item.

XIII.H.1. - Audit item.

XIII.H.2. - Audit item.

XIII.H.3. - The only semivolatile compound for which a TIC search will be used is for aramite; there is no commercial standard available. This was addressed in our September 22 response and is specified in the QAPP Section 1 task 8, page 48 and as a footnote in TABLE 7-4 (QAPP Section 7 page 11).

XIII.H.4. - Lab SOP NC-MS-0004 Table 1 was revised to include aniline and n-nitrosodimethyl amine.

XIII.H.5. - To be resolved with lab audit items.

XIII.H.6. - Audit item.

XIII.I.1. - Audit item.

XIII.I.2. - Audit item.

XIII.I.3. - Audit item.

XIII.I.4. - Lab SOP LM-WALN-4110 section 10.1.15 was revised to state that the snyder column would be prewet with ethyl ether.

XIII.I.5. - Audit item.

XIII.J.1. - Lab SOP LM-WALN-3020 section 10.2.2.2 has been revised to include the length of time of vortexing.

XIII.J.2.- To be resolved with lab audit items.

XIII.J.3. - Audit item.

XIII.J.4. - Lab SOP LM-WALN-3020 section 13.1.1 has been revised to state that the pH of the sample will be checked and recorded.

XIII.J.5. - Audit item.

XIII.J.6. - The only volatile compound for which a TIC search will be used is for isomers of PDC. This was addressed in our September 22 response and is specified in the QAPP Section 1 page 48.

XIII.J.7. - Lab SOP LM-WALN-3020 Table 5 lists methyl ethyl ketone as 2-butanone and does not have to be revised.

XIII.J.8. - To be resolved with lab audit items.

XIII.J.9. - Lab SOP NC-WC-0004 which includes total solids has been enclosed.

XIII.J.10. - Lab SOP LM-WALN-3020 does not need to be revised. The requested information is shown already shown in section 13.2.1.3.

XIII.K.1. - Lab SOP NC-MS-0002 is for aqueous samples. Since there is no need for vortexing, the SOP does not have to be revised.

XIII.K.2. - To be resolved with lab audit items.

XIII.K.3. - Audit item.

XIII.K.4. - Lab SOP NC-MS-0002 section 11.4.1 has been revised to state that the pH of the sample will be checked and recorded.

XIII.K.5. - Audit item.

XIII.K.6. - The only volatile compound for which a TIC search will be used is for isomers of PDC. This was addressed in our September 22 response and is specified in the QAPP Section 1 task 8, page 48.

XIII.K.7. - Lab SOP NC-MS-0002 Table 5 lists methyl ethyl ketone as 2-butanone and does not have to be revised.

XIII.K.8. - To be resolved with lab audit items.

XIII.K.9. - Lab SOP NC-WC-0004 which includes total solids has been enclosed.

XIII.K.10. - Lab SOP NC-MS-0002 does not need to be revised. The requested information is shown already shown in section 11.5.1.4.

XIII.L. - QAPP TABLE 1-3 states that sulfide is a typical coal tar chemical constituent and therefore will still be analyzed for in areas specified in the March 1995 QAPP.

XIII.M. - Audit item.

XIII.N.1. - Quanterra ordered refrigerators in which to store samples and they were delivered on October 9.

XIII.N.2 - Based upon my telephone conversation with you on October 10, it is my understanding that EPA will modify its August 10 comments and drop this comment. Therefore, Quanterra will not modify its SOPs at this time. If EPA does not drop this comment, it will be addressed at a later date.

XIII.N.3. - Quanterra does not routinely confirm "PCBs only" results unless requested by the client; they do confirm the pest/PCB analysis. BASF will request this confirmation.

XIII.N.4. - Audit item.

XIII.N.5. - To be resolved with lab audit items.

XIII.N.6. - Presently, Quanterra is implementing Corporate SOP CORP-GC-0001 which has a TCLP spiking list of Heptachlor, Lindane, Endrin, and Methoxychlor. Refer to Table B-7 in the SOP for spike levels and lists.

XIII.N.7. - SOP NC-OP-0009 GEL PERMEATION CHROMATOGRAPHY CLEANUP and SOP NC-OP-0013 SULFURIC ACID CLEANUP are enclosed.

XIII.O.1. - Audit item.

XIII.O.2. - Audit item.

XIII.O.3. - Audit item.

XIII.O.4. - Audit item.

XIII.O.5. - Audit item.

XIII.P.1. - Audit item.

XIII.P.2. - Audit item.

XIII.P.3. - Audit item.

XIII.P.4. - Audit item.

XIII.P.5. - Audit item.

XIII.P.6. - Audit item.

XIII.Q.1. - SOP NC-QA-0002 Section 4.8 has been revised to state that the bottle is filled. The amount of reagent used depends upon the bottle size. It is Quanterra's policy to check any analyte of interest against the quantitation limit rather than method detection limit.

XIV. - Item 5 on the Chain of Custody Procedures in the Environmental Lab has been revised to state that security is maintained on site. Visitors must be accompanied by a BASF employee; therefore, the possibility of sample tampering is very remote. Item 6 was also revised to state that the sample is either in a secure location or in the custody of an authorized individual. The only test being performed by our Research Services for this RFI is DOT spontaneous combustibility which is not a SW-846 test method.

The Chain of Custody Record has been revised slightly by removing the shading in the RSU# column.

Sincerely yours,



Bruce Roberts
Project Coordinator

enclosures

cc w/ enclosures:

Ronda Blayer, MDNR-WMD
Jon Russel, MDNR-ERD
Bob Veenstra, ESE
Tom Himes, Quanterra - w/o lab SOPs
Rock Vitale, ESI - w/o enclosures

September 22, 1995

Ms. Diane Sharrow
Project Manager
United States Environmental Protection Agency
Region V, (HRE-8J)
77 West Jackson Street
Chicago, Illinois 60604

RE: Response to EPA's final comments dated August 10, 1995

Dear Ms. Sharrow:

This letter is a response to a portion of your August 10 comments.

Below is a brief summary of the revisions to portions of the QAPP, DMP, and PMP as required by (1) your letter dated August 10, 1995, (2) typographical errors, or (3) minor improvements. There are a couple of typographical errors that have been corrected that have been highlighted but not mentioned. Enclosed are three sets of partial revisions. One set of revisions has the specific revisions highlighted or paragraphs have been bracketed with highlighter and is grouped by EPA comment number except where noted in parenthesis. The other two sets of revisions are in the same sequence as the current QAPP, DMP, and PMP and are not highlighted. Additional revisions including SOP-21 will follow at a later date.

I.A. - Section 1 pages 20 and 32 have been modified to give the entire EPA 1986 reference (page 32 is with I.B.). Also a typographical error has been corrected on page 20.

I.B. - The number of piezometers on Section 1 page 18 was changed from 4 to 1. A new task 3 was inserted on Section 1 page 31 and the remaining tasks were renumbered. Also a typographical error was corrected in the last line of task 1. The third paragraph on Section 1 page 37 was revised to give the CCR reference for the previous test results. The tasks on Section 1 page 38 were revised to reflect the number of piezometers, the location of sampling points, and the number of samples. Task 6 was revised to show staff gauges rather than gauge. The data usage section on Section 1 page 39 was revised. Figures 1-7 and 1-8 have been revised to reflect the number of piezometers and the location of wells RFIMW-1, RFIMW-13, and RFIPZ-1. TABLE 1-1 has also been revised to reflect these changes.

I.C. - SWMUs F & G samples will be analyzed for Appendix IX constituents rather than for RCRA TCLP. Section 1 page 24 was revised to reflect this change and to make parameter plural in the

paragraph above. For SWMU F, the objective, tasks, and data usage sections were revised and are in Section 1 pages 40-42. Representative samples will be analyzed for Appendix IX and only Britesorb® filter cake will be analyzed for spontaneous combustibility. For SWMU G, tasks 1 and 5 and the data usage section were revised and are in Section 1 pages 43 and 44. TABLE 1-1 has also been revised to reflect these changes (with I.B.).

I.D.1. - Section 1 page 46 was revised to show that BASF screened for 1,2-PDC. The tasks on page 48 were revised to clarify the sample scheme, depth, and number and to state that the laboratory will look for the isomers of 1,2-PDC as tics.

I.D.2. - Task 6 in Section 1 page 48 was revised rather than task 5.

I.D.3. - Section 1 page 45 was revised to include the constituents for which monitoring was required under old NPDES permits (with I.D.1.).

I.F. - Section 1 page 62 was revised to include task 8. The data usage section was revised slightly. Page 61 Task 2 has been revised to correct a typographical error.

I.G. - Section 1 page 64 has been revised to give a reference to show that well RFIMW-24 is upgradient and to ensure that its location is outside the SWMU. FIGURE 1-7 has been revised to show that the location of well RFIMW-24 is outside of the boundary of the SWMU (with I.B.). Task 6 on page 65 has been revised to state that the samples will be analyzed for ICP Method 6010 metals. TABLE 1-4 has been revised to include the ICP metals.

II.A. - Section 2 pages 2 through 8 have been respaced because information was revised and added. Section 2 page 2 has been revised to show that ESE is the RFI Consultant and that they are responsible for field activities. Page 2 also states that Environmental Standards, Inc. has been selected to conduct the data validation. Page 3 has been revised to add the name of the RFI Consultant Project Manager. It has also been revised to add the RFI Consultant Oversight Reviewer, Peer Reviewer, and Health and Safety Officer information from the revised PMP. Page 4 has been revised to include the Data Validation Manager, to add the name of the RFI Consultant QA Manager and to revise her data validation duties. Page 5 has been revised to state that analytical reports will be sent to Environmental Standards, Inc. for data validation and to show the name change of the Quanterra Operations Manager and

QA Officer. Page 6 has been revised to show the name change for the Quanterra Sample Custodian and that data will be sent to Environmental Standards, Inc. Page 7 shows the name of the RFI Consultant Field Manager and clarifies his role in data validation. Page 8 has been revised by adding a new Section 2.6.3 which shows additional RFI Consultant personnel that are mentioned in the PMP.

The cover page of the QAPP has been revised for revision 1 and for personnel changes. It is suggested that the cover page for revision 0 remain in the QAPP. The signature page has been revised to show personnel changes. It will be signed after the lab changes are addressed. The distribution list page has been revised to show the change in personnel. The TABLE OF CONTENTS pages 2 and 3 were revised because of the changes in Section 2.

Section 1 page 1 has been revised to reflect the change to ESE and that this is revision 1.

Figure 2-1 and Figure 2-2 have been revised to reflect the selection of the RFI Consultant, Data Validator, and changes in personnel.

III.A.1. - Section 3 page 5 has been revised to include reference to Table 7-4.

III.A.2. - Section 3 page 8 has been revised to include the requested information.

III.A.3. - TABLE 1-1 note 5 has been revised to state that one trip blank consists of three 40 ml vials (with I.B.). This information also appears in Section 3 page 8. When this information was included, the last sentence of page 7 shifted to page 8.

IV. - To be addressed later.

V. - Section 5 pages 2 and 3 have been revised to reflect who is keeping what information. Page 2 also reflects the name change at Quanterra. Page 3 of the DMP has also been changed and is with the other DMP pages.

VI.A. & XII.D. - Section 6 page 2 has been revised to state that the Specific Conductivity Meter will be checked after 10 uses. Field SOP-10 pages 3,5,7, and 11 have been revised to state that the calibration will be checked after 10 uses. QAPP Section 11 page 2 TABLE 11-1 has been revised to show the calibration checks.

VI.B. - To be addressed later.

VI.C. - To be addressed later.

VI.D. - To be addressed later.

VII. - To be addressed later.

VIII. - To be addressed later.

IX.A. - Environmental Standards' confidential SOPs will be submitted under separate cover.

IX.B. - BASF believes that the calibration check and blank analyses are already in Section 9.3 of the QAPP. The requested information is in Section 9 page 5 items 2 vii and 2 viii. Therefore, no revisions are required.

IX. MISC - QAPP Section 1 page 21 has been revised to clarify the last bullet in Task 7 and to remove "by the RFI Consultant in Task 8 bullet 3. QAPP Section 1 page 33 has been revised to state that the lab data validation will be conducted by Environmental Standards, Inc.

X. - Section 10 page 3 has been revised to reflect the name change.

XI.A. - Section 13 page 1 - The second paragraph has been revised per Mr. M. DeRosa's request. Also the gender was changed in the third paragraph. Page 2 has been revised by adding a paragraph on corrective action for sampling activities.

XII.A.1. - SOP-01 pages 1-3 have been revised. The sample ID number has been revised. The "Sample Type" and "Sample Date" have been removed from the ID number. The sample date will be on the sample label. Two of the sample type categories have been incorporated into the "Sample Matrix". The number of digits in the "Sample Point" was standardized to five rather than being variable so, the sample ID number will always be a 10 digit alpha numeric code. The first paragraph on page 3 Section 3.0 was revised to clarify Quanterra's bottle blank program. The second paragraph on page 3 Section 3.0 was revised to reflect the change in SOP-18 (XII.F.).

XII.A.2. - To be addressed later.

XII.B. - SOP-08 Section 3.3 page 3 item 4 was revised to state that there would be a direct transfer into the sample container and it would be filled to the top. Typographical errors on page 3 in item # 6 and page 4 in item 5 were also corrected.

XII.C.1. - SOP-09 page 4 Section 5.2 was revised to state that the container would be filled to the top. SOP-09 Section 5.1 page 3 was revised by capitalizing the heading to be consistent with other headings.

XII.C.2. - SOP-09 page 4 Section 5.3 header was revised by replacing metals with inorganics.

XII.D. - See VI.A. above.

XII.E. - SOP-15 pages 1 and 2 were revised to state that there would be a direct transfer into the sample container and it would be filled to the top. SOP-16 already states that there will be direct transfer and does not require modification.

XII.F. - SOP 18 page 2 was revised to include pH paper. Page 7 was revised to state that preservatives would be checked for proper pH and adjusted if necessary (new item 5). SOP-01 page 3 was revised to include the pH check (with XII.A.1). QAPP Section 9.2.1 page 2 was revised to include the pH check.

XII.G. - SOP-19 page 1 was revised to state that the sample preservative pH check would be recorded in the field log book.

XIII. - To be addressed later.

XIV. - To be addressed later.

MISCELLANEOUS - QAPP

Section 1 page 5 has been revised by adding the word "chlorinated" before furans in the first sentence; it was inadvertently omitted.

Typographical errors have been corrected in Section 1 page 8 and Section 1 page 9.

Typographical errors have been corrected in Section 1 pages 24 (with I.C.), 38 (with I.B.), 45 (with I.D.1.), 49, 50, 55, 66 (with I.G.), 67, and 71.

Typographical errors have been corrected in Section 3 page 2 and

Section 4 page 2.

Section 7 page 2 has been revised to include the bottle blank program and sample control in the SOPs in Appendix C.

Typographical errors have been corrected in Section 8 page 3, Section 13 page 3, and Section 14 pages 1 & 2 (page numbers).

APPENDIX B Cover and Stand Operating Procedures Field Work TABLE OF CONTENTS, without page numbers, has been added. It appeared in the June 1994 QAPP but, not in the March 1995 QAPP.

SOP-02 Section 5.1 page 3 was revised by capitalizing the heading to be consistent with other headings.

Typographical errors have been corrected in SOP-6 page 3, SOP-14 page 6, and SOP-21 page 8.

MISCELLANEOUS - DATA MANAGEMENT PLAN

A revised cover page is included showing revision 1. It is suggested that the older cover page be retained.

Page 2 - last bullet was revised by adding "validated".

Page 3 was revised by adding information on Quanterra and Environmental Standards, Inc.

Page 4 - first full paragraph was revised to state that Environmental Standards, Inc. would review the analytical data. The word "validated" was also added in the last sentence of that paragraph.

Page 5 - last paragraph before Section 5 was revised by including Environmental Standards, Inc.

MISCELLANEOUS - PROJECT MANAGEMENT PLAN

A revised cover page is included showing revision 1. It is suggested that the older cover page be retained.

The TABLE OF CONTENTS page i has been revised to show a new section 3.2.7 Data Validation and to correct a typographical error.

Section 2 page 1 contained a typographical error in the third paragraph.

Section 3 page 1 has been revised to state that ESE and Environmental Standards, Inc. have been selected by BASF.

Section 3 page 3 was revised to show the names of the RFI Consultant positions. "Peer Reviewer" was made singular and the last sentence was removed.

Section 3 page 4 was revised to show the names of the RFI Consultant positions and to add Section 3.2.7 Data Validation.

Section 3 page 5 and page 7 were revised to show that analytical reports would be sent to Environmental Standards, Inc. Page 5 was also revised to show the new Quanterra Operations Manager.

Section 3 page 6 was revised to show the name change of the Quality Assurance Officer and Sample Custodian.

FIGURE 1 and FIGURE 2 were revised to show the selection of ESE and Environmental Standards, Inc. and changes in personnel at Quanterra.

Sincerely yours,



Bruce Roberts
Project Coordinator

enclosures

cc w/ enclosures:

Ronda Blayer, MDNR-WMD
Jon Russel, MDNR-ERD
Bob Veenstra, ESE
Tom Himes, Quanterra
Rock Vitale, ESI -w/o enclosures

From: DIANE SHARROW
To: DEROSA-MICHAEL, R5SCI.R5ESD.PAYNE-DAVID
Date: Wednesday, September 13, 1995 4:48 pm
Subject: BASF-Dave's Comments on Act 307 MDLs

I wanted to talk to you both briefly about my responses/interpretations of Dave's comments on Tuesday. I am sorry I need so much hand-holding, but this is the first corrective action site I have had from Day 1 - all the others were inherited well into the process. I haven't heard from either of you - but I did see Dave in the hall Tuesday - so I thought I would give you an idea of what I thought of Dave's comments (there are still a few words I can't decipher) and ask you both, what happens next? Does Dave finalize his Lab Audit comments, including non MDL "stuff" or do I need to formalize my response to Dave? and/or Facility/Lab?

1. Let BASF make the call as to whether those constituents that are not tested routinely by App. IX should be included, since the Facility wnts to make sure MDNR requirements are satisfied. However, there are two constituents that I would require testing for because of eco concerns - benzidine and chlorpyrifos. Also, what in the heck is gentian violet? I know that genitians are a family of plants - generally violet in color . . . (Once a biologist, always a biologist - but definitely not a biochemist!!!)

2. If those constituents marked NR can readily be done by App. IX - why not, to ensure BASF is satisfying MDNR requirements.

3. Which MDLs for which organics cannot be achieved? How significant of a problem is this?

4. I would suggest using the MDL of 5 ug/l (or 10 ug/l) for onsite media, and make the assumption clearly that if the performance evaluation of the current pump and treat in the submitted RFI indicates that g-w is reaching Detroit River, then a more cosnervative AWQC/eco assumption may apply to remediation.

5. I would prefer being more stringent than MDNR, esp for Barium (eco concern).

Special Cases

6. COMMON PROB of metals in soil - I would be interested in knowing what "everyone" else in REB is doing, but the following metals are of impt to me based on site history and eco concerns - Antimony, Cadmium, Lead, and Nickel.

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but would like the chemist's thoughts on processes that may have employed methylene chloride and di-n-but-phthalate. If not hist concern, then use allowable amt instead of MDNR's MDL.

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10. If this is incorrect, then what is correct?

11. See No. 6 - Cd

12. .02 or .2 for Clordane - I am still looking at DCC to see if any liklihood this may be present at site.

13. COMMON PROB Go w/25 ug/l using 8270

14. PBBs - drop this from list.

15. COMMON PROB Use the "bridge" and do not give an option on the more toxic.

16. Go with waht is achievable for silver.

17. I have what I believe is a complete copy of the applicable older/Act 397 Operational memos - doesn't the Lab?

I would appeciate your input - I am in training tomorrow to learn how to deal with Confrontation and Dispute Resolution - here's to seein a less confrontational Diane on Friday!

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9.



Environmental
Science &
Engineering, Inc.

July 26, 1995

RECEIVED
JUL 31 1995

OFFICE OF RCRA
WASTE MANAGEMENT DIVISION
EPA, REGION V

Ms. Diane Sharrow
Office of RCRA, Region 5
U.S. Environmental Protection Agency
HRP-8J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

RE: Michigan Cleanup Levels for BASF Corporation RFI QAPP
EPA ID Number MID 064197742
ESE Project Number: 4695-010-999-0000

Dear Ms. Sharrow:

Attached please find one (1) copy of the recently promulgated legislation modifying the Michigan Environmental Response Act 201 and the associated "Operational Memorandum #14, Revision 2." Act 201 was signed into law on June 2, 1995, and effectively replaced Act 307.

As you recall, Appendix A of the draft RCRA Facility Investigation Quality Assurance Project Plan (QAPP) for the BASF North Works facility contained the previous version of Operational Memorandum 14 (Revision 1), to be used as the action levels for this investigation (as referenced on Page 25 of 71 in Section 1 of the QAPP). As promised in our meeting last week, I have provided for your review the most current regulatory language, as well as the most current Michigan Department of Natural Resources implementation memorandum on this subject.

If you have any questions on this matter, please feel free to contact Mr. Bruce Roberts of BASF at (313) 246-5211, or myself.

Sincerely yours,

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Robert B. Veenstra
Senior Program Manager

RBV/dkp
Attachments

cc: Bruce Roberts, BASF

J:\V014695010P.003

*Reb Audit**FROM BART*

Action items

Agreed 1. I.A. - For EPA 1985 reference only, spell out document in QAPP.

Agreed 2. I.B - For sediment sampling, collect 2 discrete samples from each pond along the center line of flow. One will be at the head end and one will be at the tail end. Send all 4 samples to lab for parameters specified in March QAPP. Move well RFIMW1 and RFIMW 13 closer to pond. Move RFIPZ-2 south and use it for GW Extraction system evaluation. RFIPZ-1, RFIPZ-3, and RFIPZ-4 will be eliminated because they are no longer needed. Analyze RFIMW-13 for APP IX one time. Timing to coincide with perimeter well sampling which will not change.

*once for March 13
only for
new 22*

Agreed 3. I.C. - Obtain representative samples of materials (not just filter cake) and analyze for APP IX rather than TCLP. Filter cake sample will be analyzed for DOT spontaneous combustibility as March QAPP states.

Agreed 4. I.D. - Analyze samples for APP IX rather than CLP.

Agreed 5. I.E.1 - EPA to drop comment; info was in CCR.

Agreed 6. I.E.2. - Look for TICs (associated with 1,2 PDC only) if 1,2 PDC is above *action levels of 6.4k*

7. I.E.3. - Clarify QAPP on sampling strategy and sample depth

8. I.E.4. - Modify QAPP to include the chemicals that were in the former NPDES permits and state that they are on APP IX.

Questions: will screening appropriate for this phase 9. I.F. - Modify QAPP by moving statement in the Data Usage section into bullet #8 that explains we will *stop* out if still see contamination. *Move words*

10. I.G. - Analyze for all ICP method 6010 metals not just 8 RCRA metals.

II - revise to state ESE. 11. III.A - Modify QAPP Section 3 to reference Table 7-4.

12. III.B. - Modify QAPP Section 3 to reference where to find info in EPA comment.

13. III.C. - Modify QAPP table 1-1 notes to show 3 ea 40 ml VOA bottles.

Drop IV A & C. 14. IV.C. - Modify QAPP to drop "sample type" for duplicate samples.

Agreed 15. V.A. - Modify QAPP to state that Quanterra will maintain some files.

16. VI.A. - Modify Section 6 of QAPP to state that meter will have

Agreed

Agreed

Agreed

Agreed

*Agreed
Reck's 24.5
together
Reverse
to clarify*

~~Set~~
calibration checked after 10 uses also modify field SOP to state same thing.

17. VI.B. - Modify field SOP to be consistant with Section 6 concerning continuing calibration.
18. VI.D.1. - Modify all applicable tables in QAPP that give method numbers as needed. QAPP to list the method that the lab will use (does not have to be latest SW 846 method).
19. VI.D.2. - EPA to drop comment.
20. VI.D.3. - Modify all applicalbe QAPP tables that use "RL" and change to PQL.
21. VI.D.4. - Modify all applicable QAPP tables to fill in missing info for PG and PO.
22. VII.A.1. - Same as # 18.
23. VII.A.2. - Same as # 18.
24. VII.B. - Same as # 18.
25. VII.C. - Same as # 18.
26. VIII.A. - OPEN ITEM Modify QAPP to give ESI method if approved by EPA.
27. IX.A. - EPA to drop comment. — note field logs + calibration.
28. IX.B. - Modify QAPP to include ESI data validation SOPs. SOPs to be treated as "CONFIDENTIAL BUSINESS INFORMATION."
29. IX.C.1. - Modify QAPP to include requested QC data.
30. IX.C.2. - EPA to drop comment.
31. X.A. - Modify QAPP to show lab name change.
32. XII.A.1. - See # 14.
33. XII.A.2. - Already stated that way in QAPP.
34. XII.A.3. - Quanterra to modify SOP.
35. XII.B.1. - Modify SOP 8 section 3.3.4 to state that there will be a direct transfer of sample to bottle for volatile analyses.
36. XII.B.2. - EPA to drop comment; solids are not preserved.
37. XII.C.1. - Modify SOP 9 to state volatile containeres will be filled to top.

BASF
must submit
the MAS
CBI, i.e.
Make the
claim.

38. XII.C.2. - Modify SOP heading in Section 5.3 by replacing "metals" with "inorganics".
39. XII.D.1 - Modify QAPP to show continuing calibration in field SOP.
40. XII.E.1. - EPA to drop comment; solids are not preserved.
41. XII.E.2. - Modify SOP 8 to state that there will be a direct transfer of sample to bottle for volatile analyses.
42. XII.F. - EPA to drop comment; specified in SOP.
43. XII.G. - Modify SOP 18 to state that pH of preserved sample will be checked and adjusted if necessary.
44. XII.H. - Modify SOP 19 to reflect changes made in SOP 18.
45. XIII.A. - Copy of SOPs given to EPA at meeting. Will send copy via certified mail.
46. XIII.B. - Quanterra to modify SOP.
47. XIII.C.1 - Quanterra to modify SOP to include use of decachlorobiphenyl.
48. XIII.C.2&3. - To be addressed in lab audit.
49. XIII.D.1. - On hold per D. Payne.
50. XIII.D.2. - Quanterra to add SOP for Total Solids.
51. XIII.D.3. - To be addressed in lab audit.
52. XIII.E.1. - To be addressed in lab audit.
53. XIII.E.2. - To be addressed in lab audit.
54. XIII.E.3. - Comment only, no action required.
55. XIII.E.4. - To be addressed in lab audit.
56. XIII.E.5. - To be addressed in lab audit. Comment to be changed to replace MDL with PQL.
57. XIII.F.1. - Quanterra to add SOP for Total Solids.
58. XIII.F.2. - Comment to be changed to replace MDL with PQL.
59. XIII.G.1. - Quanterra has changed SOP to include distillation step.
60. XIII.G.2. - Comment to be changed to replace MDL with PQL.

4

61. XIII.H.1&2. - To be addressed in lab audit.
62. XIII.H.3. - No TICs planned but see # 6. Basalin to be checked against a standard.
63. XIII.H.4. - Applicable QAPP table to be modified.
64. XIII.H.5. - QAPP Target Reporting Limit in Table 7-4 to be raised to what lab states in SOPs.
65. XIII.H.6. - EPA to drop comment, not an issue.
66. XIII.H.7. - To be addressed in lab audit.
67. XIII.I.1.,2.,&3. - To be addressed in lab audit.
68. XIII.I.4. - Quanterra to modify SOP.
69. XIII.I.5. - To be addressed in lab audit.
70. XIII.J.1. - Quanterra to modify SOP.
71. XIII.J.2. - OPEN ISSUE Data validation issue. BASF to respond to EPA final comments.
72. XIII.J.3. - To be addressed in lab audit.
73. XIII.J.4. - Quanterra has modified SOP.
74. XIII.J.5. - To be addressed in lab audit.
75. XIII.J.6. - None planned, not an issue.
76. XIII.J.7. - Quanterra to modify SOP.
77. XIII.J.8. - QAPP Target Reporting Limit in Table 7-4 to be raised to what lab states in SOPs.
78. XIII.J.9. - See # 50. *Quanterra to add SOP for total solids*
79. XIII.J.10. - Quanterra to correct.
80. XIII.K. - See responses for XIII.J.
81. XIII.L. - See # 59. Sulfide analysis for soils to be dropped from work plan except for AOC 7.
82. XIII.M. - OPEN ISSUE Quanterra to look at sulfur interference issue. *EPA does not have alternative method to suggest.*
83. XIII.N.1. - *Discussed and*
84. XIII.N.2. - *Accepted by BASF?*

*agreed**agreed**Quanterra has changed SOP*

5

85. XIII.N.3. - ? - *Confirm both TTS and ND's?*
86. XIII.N.4. - To be addressed during lab audit.
87. XIII.N.5. - QAPP Target Reporting Limit in Table 7-4 to be raised to what lab states in SOPs.
88. XIII.N.6. - Comment only, no action required.
89. XIII.N.7. - Quanterra to modify SOP.
90. XIII.O. - To be addressed during lab audit.
91. XIII.P. - To be addressed during lab audit.
92. XIII.Q.1. - Quanterra to modify SOP.
93. XIII.Q.2. - Comment to be changed to replace MDL with PQL.
94. XIV.A. - SOP to be modified.

*95. ESE to send EPA MDNR Memo 14 Revision 2 that has new Industrial direct contact values. New values to be used as action criteria.

OPEN ISSUE 100% data validation - EPA considering if necessary.

OPEN ISSUE SOP 21 conference call next week to discuss.

Learning towards requiring

7/27

Bruce

Mike & I have both been working on other sites/cases. How 'bout a call on 8/1 AM or 8/3?

Other Issues:

- integrity of sea wall & 4.1 of
- Identification of pipeline location between North & South works
- AOC 2 → free phase capture
- well screenings appropriate & 1.5.19 of QAPP
- Outfalls relating to depth all the way to Grassy Isle
- & 1.1 → potential identification of contaminated sediments. Identification of potential fast transport to sediments.

JUN 02 1995.

HR2-85

Mr. Bruce Roberts
BASF Corporation
1609 Biddle Avenue
Wyandotte, Michigan 48192

RE: Draft QAPP Comments
BASF North Works
MID 064 197 742

Dear Mr. Roberts:

Enclosed are the United States Environmental Protection Agency (U.S. EPA), Region 5's draft comments on referenced Quality Assurance Project Plan. Mr. Michael DeRosa, the Region 5, RCRA Enforcement Branch's Quality Assurance Coordinator, has agreed to be available to you during my absence to address any questions or concerns that you may have regarding these draft comments. Mr. DeRosa will also forward to you U.S. EPA, region 5's draft comments from the Laboratory Audit if they are completed prior to my return, as well as address any questions or concerns you may have regarding this second set of draft comments. If you would like, Mr. DeRosa can also schedule a meeting with you during my absence. The meeting would be held after my return July 5, 1995. Mr. DeRosa's telephone number is (312) 353-7992.

Based on the draft QAPP comments and an initial review of the revised RFI workplan, it appears that an approval with comments may be a viable option. I will have a better sense of whether this option will be pursued by U.S. EPA, Region 5 after I review the Laboratory Audit comments. I would also like to know if Woodward Clyde would be making any changes in response to an approval with comments or conditions, or would another consultant. I can be reached after July 5, 1995, at (312) 886-6199. In the interim, you can also leave voice mail messages at this number, or speak to my supervisor, Lauer Lodisio, at (312) 886-7090. thank you for your cooperation.

Respectfully,


Diane M. Sharrow

Enclosure

cc: J. Russel, MDNR-Livonia
R. Blayer, MDNR-Lansing
M. DeRosa, USEPA

From: DIANE SHARROW
To: R5SCI.R5ESD(TSAI-CHENG-WEN)
Date: Thursday, June 1, 1995 8:26 am
Subject: Staff Meeting -Forwarded -Reply -Reply

I will be out of the office from **Friday June 2, 1995**, through **Wednesday July 5, 1995**. If you need to reach me, you can leave a message on my voice mail at home (708) 394-0716, but there is absolutely no guarantee you will hear back from me. Or you can:

- 1) Contact my secretary Brenda Engram at 6-4465, or
- 2) Contact my supervisor Laura Lodisio at 6-7090, or
- 3) Contact Barb Mazur at 6-1478 for ecological, NRDA, GLNPO, Subpart S or REB endangered species issues, or
- 4) Contact Chuck Maurice at 6-6635 for broader OR endangered species issues, and RPB endangered species issues, or
- 5) Contact my office voice mail at 6-6199 and leave a message that I can address after July 5th.

Thanks!

OAPP meeting with Diane and Mike Denosa, and it is decided that the OAS commits will be forwarded to BASF's contractor. If a meeting to discuss the Commit is requested by BASF contractor, it will be scheduled for early July 1995.

Per Mike, BASF is bringing in a second contractor. They'll make sure that the second contractor will not alter the OAPP, but to follow it after it is approved. Field audit may be initiated to ensure the ~~see~~ OAPP is followed by the second Contractor.

Recorded by C-W Tsai
6/1/95

From: DIANE SHARROW
To: R5SCI.R5ESD.TSAI-CHENG-WEN, DEROSA-MICHAEL
Date: Wednesday, May 31, 1995 9:35 am
Subject: QAPP Comments for BASF

Meet tommorrow at 9 am in Room 815 to discuss QAPP comments for BASF North Works.



FILE COPY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SQ-14J

DATE: MAY 23 1995

SUBJECT: Review of the Quality Assurance Project Plan for the RCRA Facility Investigation at the BASF Facility in Wyandotte, Michigan

FROM: George Schupp, Chief
Quality Assurance Section

TO: M. Dunon, Chief
MI/WI/IL Permit Section

The Quality Assurance Section (QAS) and the Contract Analytical Services Section (CASS) staff have jointly reviewed the Quality Assurance Project Plan (QAPP) for the RCRA Facility Investigation (RFI) at the BASF Facility in Wyandotte, Michigan (QAS Login No.: R221). We noted that there are several deficiencies that need to be addressed to facilitate this subject QAPP for approval. Our detailed comments are included in Attachment I.

To assist in addressing the deficiencies, we strongly suggest that a meeting be held between your staff and QAS QAPP reviewer. Please contact Dr. Tsai to arrange for the meeting.

If you have any questions regarding this memo and/or the attachment, please contact Dr. Cheng-Wen Tsai, of my staff, at (312) 886-6234.

Attachment



Printed on Recycled Paper

ATTACHMENT I

This Attachment contains the detailed comments on the Quality Assurance Project Plan (QAPP) and the Standard Operating procedures (SOPs).

I. PROJECT DESCRIPTION

- A. In Section 1.5.1 (Groundwater Investigation), "following method in USEPA 1986" is not clear. Please revise Task 8 (page 32 of 71) for clarity.
- B. In Section 1.5.6 (SWMU E - Polyols Pond), please address the following:
 - 1. Describe the past analysis of sediment performed prior to disposal, including the test parameters, analytical methods used, and findings (page 37 of 71).
 - 2. Please provide the rationale of limiting the current analysis to only those parameters that are listed in Table 1-2.
 - 3. It was indicated in Task #2 that the number of samples is consistent with previous sampling for disposal characterization, and samples will be combined into two composites (one for each pond). We question whether the approach as it was stated is adequate (or appropriate) for the FRI. Please revise the section to address the following:
 - a. Please describe the sampling network design and rationale for this particular activity.
 - b. Please specify the number of samples to be collected from each pond.
 - c. Please provide the rationale of collecting composite samples.
 - 4. It was mentioned in Task #4 that three monitoring wells will be installed. However, no sampling and analysis of these monitoring wells were mentioned. Please describe the rationale for not sampling the monitoring wells?
 - 5. We do not agree with the statement "Mounding of the groundwater surface in the vicinity of the Polyols Pond would be possible evidence of leakage from the Polyols Pond and a potential impact to groundwater. If mounding of the groundwater is detected, groundwater samples will be collected from the four piezometers and three monitoring wells and analyzed for constituents on the Appendix IX (Table 1-1).". We do not think this is a good approach because it involves

several uncertainties (e.g., how much of mounding is considered as evidence of leakage? Will the groundwater pumping at the extraction wells affect the mounding measurements?). We suggest that groundwater samples from monitoring wells as well as piezometers be collected and analyzed to assess the extent of contamination, if any, resulting from leakage of the pond or from other sources.

6. The statement in page 39 of 71, "If hazardous constituents are not found in the pond sediment and groundwater mounding is not found, then no further actions will be necessary at the Polyols Pond." is not acceptable because of the following:
 - a. Throughout the section, the parameters to be tested for sediments were not specified.
 - b. The mounding of the groundwater is not a good approach for making decision whether groundwater should be sampled and analyzed.
 - c. Whether hazardous constituents are detected in sediments or not has no bearing on the pollution of the groundwater on site.
- C. In Section 1.5.7 (SWMU F - Filter Cake Disposal Area), please address the following:
 1. It was indicated in page 40 of 71 that the filter cakes was not the only wastes that were disposed in this area. However, the description of the possible hazardous exposure of the wastes or migration of the wastes into surface water or groundwater were limited to the filter cakes. It appears that the statement provided in second paragraph of page 40 of 71 was oversimplified.
- D. In Section 1.5.8 (SWMU G - Two Nominal Rubble Storage Areas), assessing the potential of releasing hazardous constituents from the rubbles should be included as part of the investigation to determine whether further investigative work or corrective action is necessary.
- E. In Section 1.5.9 (SWMU H - Emergency Containment Pond), please address the following:
 1. In page 46 of 71, the subsurface screening survey was referred to the Appendix J of the Current Condition Report (CCR). However, Appendix J was not included in the CCR. Please provide the missing Appendix J.
 2. It was indicated that, from the subsurface screening, the concentration range of the propylene dichloride (PDC) was

found to be up to 10,000 ppm in soil. It was not clear whether the reported value was for one of the PDC isomers or for the sum of all of the isomers. How was the screening instrument calibrated? Please address this issue.

3. Tasks #5 indicated that soil boring will be advanced to a depth of 20 feet. However, it was not clear how samples for the laboratory analysis will be selected from the 20-foot soil column (e.g., Will individual samples be collected from different sections of the column, or composite samples will be prepared?) Please address it accordingly.
4. It is our understanding that the pond was not lined, and, though it was dredged periodically, there is potential for the contaminants to penetrate into the groundwater. It was indicated that the entire open drainage system was operated under the facility's NPDES permit. What were the contaminants that were required to be monitored under the NPDES permit? Shall groundwater from the monitoring wells be analyzed for contaminants that were not covered under the NPDES permit requirement. Please address it accordingly.

F. In Section 1.5.15 (AOC 6 - Tar Area (South End)), the following should be properly addressed:

1. Neither the task objectives nor the data usage were stated properly. It is our understanding that the area was not lined and there is potential for the constituents of the buried coal tar to migrate into the surrounding soil as well as the groundwater. (Note: The groundwater extract system will not prevent the constituents of coal tar from migrating into the groundwater. It may, in fact, accelerate the downward migration.) With this in mind, the objectives of this task should be to define the boundary of the buried coal tar area, to determine the horizontal and vertical soil contamination outside the boundary, and the impact on the groundwater.
2. Soil samples should be collected from outside the boundary. As a results, the boundary of the buried coal tar area should be determined. The soil boring should be continued until the boundary is reached. This means when the boring hit the coal tar, a new boring should be done 10-20 feet away from the previous boring location.
3. The description did not address how the vertical extent of the buried coal tar (or the depth of the buried coal tar) will be determined.

G. In Section 1.5.16 (AOC 7 - Prussian Blue Area), please address the following:

1. Per Table 1-1, 11 samples will be collected for metal analysis and 23 samples for cyanide analysis. It is not clear how many soil boring will be performed, and, from each boring, how many samples will be collected. Furthermore, what is the rationale of collecting 11 samples for metals and 23 samples for cyanide?
2. We noted that monitoring well RFIMW-24 was designated as the background location, and the monitoring well RFIMW-23 is the downgradient from AOC 7. Please address the following:
 - a. Is the monitoring well RFIMW-24 really upgradient from AOC 7 and can be used as background location? It is our understanding that, on the east side of the facility, the groundwater flows toward the Detroit River most the time of the year while, on the west side, groundwater flows away from the river. The AOC 7 located at the borderline between eastern and western boundary. It appears that it is inappropriate to designate these two monitoring wells as upgradient and downgradient wells respectively.
 - b. What is the purpose of designating RFIMW-24 as the background location?

II. PROJECT ORGANIZATION AND RESPONSIBILITY

- A. Please identify the party who is responsible for the following functions respectively:
 1. Field sample collections.
 2. Field screening and measurements.

III. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION, ACCURACY, COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY

- A. To aid in assessing the accuracy, the method detection limit and/or the sensitivity of the instrument for each analyte of concern should be specified. A table will be acceptable.
- B. For assessing the accuracy of laboratory analysis, QC samples should include reagent blanks, field blanks and trip blanks (for VOC analysis only). Please address it accordingly, including the frequency of analyzing these QC samples.
- C. For the collection of trip blanks for VOC analysis, please specify that one trip blank consists of two 40-ml vials.

IV. SAMPLING PROCEDURES

- A. See comments XII on Appendix B.
- B. Sample chain-of-custody should be part of the sampling procedure. Please note that the chain of custody should be initiated at the time of sample bottle preparation.
- C. See comments XII.A.2 on sample identification number.

V. CUSTODY PROCEDURES

- A. In Section 5.3 (Final Evidence Files), please specify the content of the evidence file (e.g., what type of documents, information and data will be kept in the evidence file?).
- B. See also comments XII.A.4 and XIII on chain of custody procedure.

VI. CALIBRATION PROCEDURES AND FREQUENCY

- A. For specific conductivity meter, please address the requirement of continuing calibration check, including the frequency.
- B. For dissolved oxygen meter, please address the requirement of continuing calibration check, including the frequency.
- C. See also comments XIII on Appendix C (in relation to calibration).
- D. In Table 6-1, please address the following:
 - 1. Please change method number from "8080", "8240A", "8260", "8270A", "8150A", "7470" and "8015" to "8080A", "8240B", "8260A", "8270B", "8150B", and "7470A" respectively.
 - 2. For organic analyses, please add the analysis of method blank.
 - 3. Without defining it, the term "RL" had been used to express the acceptance criteria. Please provide a footnote to define the RL term. We reserve the right to comment further when RL is defined.
 - 4. Please complete the table by filling the missing information for the analysis of propylene glycol and propylene oxide.

VII. ANALYTICAL PROCEDURES

- A. Some of the method numbers in Table 7-1 should be revised as a result of the update II of the SW-846 methods:
 - 1. For arsenic & selenium, change "7060A" to "7060A & 7741A".

2. For semivolatiles, change "3520A" to "3520B".
- B. Some of the method number in Table 7-2 should be revised as a result of the update II of the SW-846 methods:
1. For selenium, change "7740" to "7741A".
 2. For pesticides/PCBs, change "8080" to "8080A".
 3. For volatile organics, change "8240A" and "8260" to "8240B" and "8260A" respectively.
 4. For semivolatiles, change "8270A" to "8270B".
 5. For herbicides, change "8150A" to "8150B".
 6. For propylene glycol/oxide, change "8015" to "8015A".
- C. Some of the method numbers in Table 7-4 should be revised as a result of the update II of the SW-846 methods. See comments VII-A and VII-B on Table 7-1 and 7-2 respectively.

VIII. INTERNAL QUALITY CONTROL CHECKS

- A. In Section 8.1, the statement "Generally, analytical results greater than 5 times of the quantitation limit should have RPDs less than 40. If either analytical results (i.e., the investigatory or duplicate) is less than or equal to 5 times the quantitation limit, the results should agree within two quantitation limits." was inappropriate and unacceptable. For analytical results greater than 5 times of the quantitation limit, the RPD should be less than 25% while, for analytical results less than 5 times of the quantitation limit, RPD can be $\leq 35\%$. Please revise the statement accordingly.

IX. DATA REDUCTION, VALIDATION, AND REPORTING

- A. In Section 9.2.1 and 9.2.2, please include the criteria used for data validating the field data.
- B. In Section 9.2.3, please specify the criteria to be used for the validation of laboratory data.
- C. In Section 9.3, please address the following:
1. Please include the QC data such as calibration check and blank analyses.
 2. In Section 9.3.2, the case narrative should include the corrective actions that were taken to solve any problems encountered during sample preparation and analysis.

X. PERFORMANCE AND SYSTEM AUDITS

- A. In Section 10.2.4, please change "Central Regional Laboratory" to "Contract Analytical Services Section of the Monitoring and Quality Assurance Branch."

XI. CORRECTIVE ACTIONS

- A. In Section 13.1, the discussion was focused mainly on the field measurements. Please add a paragraph to address corrective actions for sampling activities.

XII. APPENDIX B - STANDARD OPERATING PROCEDURES FOR FIELD TASKS

A. SOP-01 (Analytical Samples Handling Protocol)

1. In Section 2 (Sample Identification), we believe the "Sample Type" is redundant to "Sample Matrix" and should be deleted. This will shorten the sample identification number.
2. It is beneficial to label QA/QC samples the same way as the investigative samples (e.g., as blind samples). The results of these QC samples will serve as a second check on laboratory performance.
3. In Section 3.0 (Sample Containers and Preservation), it was stated that sample containers will be provided by the contracted analytical laboratory and will be certified as clean. Please provide the laboratory's SOP for sample container preparation.
4. In Section 5.0 (Chain-of-Custody Protocol), the chain of custody should be initiated from the time sample containers are prepared.

B. SOP-08 (Surface Soil/Sediment Sampling Procedures)

1. This SOP is oversimplified, and should be revised to address the collection of samples for different parameter/analysis (e.g., soil samples for volatile organics should not be homogenized in a stainless steel pan to avoid loss of VOCs).
2. A section should be added to address the sample preservation requirements.

C. SOP-09 (Drilling and Sampling using An Earth-Probe Rig)

1. In Section 5.2, for VOCs, sample containers should be filled with minimum void space to avoid loss of VOCs.

2. A section should be added to address the sample collection for inorganic parameters.
- D. SOP-10 (Field Measurements of Groundwater Field Parameters)
1. For pH measurement, please add the procedure for continuing calibration check as it is stated in Section 6.0 of the QAPP.
- E. SOP-15 (Pond Sediment Sampling Procedure) and SOP-16 (Surface Water Sampling procedure) did not include the following:
1. Sample preservation for different parameter groups.
 2. Specific procedures for collecting VOC samples not provided.
- F. SOP-17 (Heavy Equipment Decontamination) did not provide the actual decontamination procedures.
- G. SOP-18 (Groundwater sampling) failed to address the sample preservation.
- H. SOP-19 (Field Data Recording and Management Procedures) should record the information of sample preservation in the field logbook and/or the field note sheets.

XIII. APPENDIX C - STANDARD OPERATING PROCEDURES FOR LABORATORY TASKS

- A. Analytical methods for the analysis of propylene oxide and propylene glycol were not provided. Please provide the missing SOP for propylene glycol and propylene oxide.
- B. Sample Receiving
1. In Section 4.1, checking samples for proper preservation should be included as one of the items to be checked and recorded at the time of sample receiving.
- C. Continuous Liquid/Liquid Extraction Method for Semi-Volatile Organics in Water Samples
1. Dibutyl chlorendate should not be used as surrogate.
 2. The matrix spike levels (100/200 ug/L) were too high.
 3. The concentration level of the LCS (100/200 ug/L) were too high.
- D. Sonication Extraction Method for BNAs, Pesticides/PCBs, OPPs, TRPHIRs, and Extractable TPHs in Solid Samples
1. Before performing the soil sonication for SVOA analysis, the

pH of the soil needs to be taken. If the pH is above 10, no target acid compounds or surrogates will be recovered from the sample. The pH of the sample should be adjusted with 1:1 HCL to a pH of 7.

2. The method needs to include a procedure for determining the percent moisture. Sample results should be reported on a dry weight basis.
3. The matrix spike level for BNAs and PAHs were too high.

E. Analysis of Water and Soil Samples for Metals by ICP

1. Method only uses a 1-point calibration. RCRA method 6010A requires a 3-point calibration.
2. In order to meet the targeted quantitation limits stated in the QAPP, the following metals will have to be measured by GFAA:

Antimony	Arsenic	Cadmium	Chromium	Lead
Selenium	Thallium	Zinc	Vanadium	

3. The high pH present in some parts of the site (pH \geq 11) may reduce the probability of finding metals in some samples, since many metals are not soluble in water at this pH.
4. The SOP should include the linear range for each metal.
5. Method blank should not contain any analyte of interest at concentrations exceeding the method detection limit. When this criteria is exceeded, corrective action should be taken.

F. Analysis of Soil Digestates for Total Mercury by Cold Vapor AA

1. Soil results should be reported on a dry-weight basis.
2. See also comment XIII.E.5.

G. Total Mercury by Cold Vapor AA for Aqueous Samples

1. The analytical procedure presented is acceptable for the analysis of water samples, but is not acceptable for the analysis of soil samples. To prevent thiocyanides and cyanide, which are present at the site, from interfering with the titration, a distillation step must be added to the method. (See SW846 method 9030A)
2. See comment XIII.F.2.

H. GC/MS Semivolatile Organic Compounds/Capillary Column Techniques

(Based on Method 8270)

1. The percent difference for all compounds in the continuing calibration checks should be $\leq 30\%$, except for compounds included in the CCC mix, which should have percent differences $\leq 20\%$. The 50% difference in continuing calibration listed in the laboratory method seems excessive.
2. The relative standard deviation for all compounds not included in the CCC mix should be $\leq 15\%$. For any analyte that does not meet this criteria, a linear equation must be generated for sample quantitation.
3. The workplan lists no criteria for performing tentatively identified compound (TIC) searches. Will TIC searches be performed at this site, and if so, what criteria will be used in reporting the data.
4. Aniline and n-nitrosodimethyl amine are listed as SVOA analytes for the site, but is not listed as analytes in the SVOA methods.
5. For groundwater samples, the reporting limits for the following compounds are above the targeted quantitation limits listed in Table 7-4 of the QAPP. A detailed explanation on how the laboratory plans to meet these lower targeted quantitation limits listed in the QAPP needs to be submitted.

<u>Compound</u>	<u>QAPP Target Reporting Limit</u>	<u>Method Reporting Limit</u>
Acenaphthene	5µg/L	10µg/L
Acenaphthylene	5µg/L	10µg/L
Anthracene	5µg/L	10µg/L
Benzo (a) anthracene	5µg/L	10µg/L
Benzo (b) fluoranthene	5µg/L	10µg/L
Benzo (k) fluoranthene	5µg/L	10µg/L
Benzo (ghi) perylene	5µg/L	10µg/L
Benzo (a) pyrene	5µg/L	10µg/L
bis (2-Chloroethyl) ether	5µg/L	10µg/L
bis (2-Ethylhexyl) phthalate	5µg/L	10µg/L
4-Bromophenol phenyl ether	5µg/L	10µg/L
Butyl benzyl phthalate	5µg/L	10µg/L
Chrysene	5µg/L	10µg/L
Diallate	5µg/L	10µg/L
Dibenz (ah) anthracene	5µg/L	10µg/L
Dibenzofuran	5µg/L	10µg/L
di-n-Butylphthalate	5µg/L	10µg/L
Diethylphthalate	5µg/L	10µg/L
Dimethylphthalate	5µg/L	10µg/L
2,4-Dinitrotoluene	5µg/L	10µg/L

2,6-Dinitrotoluene	5µg/L	10µg/L
Fluoranthene	5µg/L	10µg/L
Fluorene	5µg/L	10µg/L
Hexachlorobenzene	5µg/L	10µg/L
Hexachlorobutadiene	5µg/L	10µg/L
Hexachlorocyclopentadiene	5µg/L	10µg/L
Hexachloroethane	5µg/L	10µg/L
Indeno (123-cd) pyrene	5µg/L	10µg/L
Isophorone	10µg/L	20µg/L
Isasafrole	5µg/L	10µg/L
2-Methylnaphthalene	5µg/L	10µg/L
Naphthalene	5µg/L	10µg/L
Nitrobenzene	5µg/L	10µg/L
n-Nitrosodiphenylamine	5µg/L	10µg/L
n-Nitrosodi-n-propylamine	5µg/L	10µg/L
Pentachlorobenzene	5µg/L	10µg/L
Phenanthrene	5µg/L	10µg/L
Pyrene	5µg/L	10µg/L
1,2,4,5-Tetrachlorobenzene	5µg/L	10µg/L
1,2,4-Trichlorobenzene	5µg/L	10µg/L
4-Chloro-3-methylphenol	5µg/L	10µg/L
2-Chlorophenol	5µg/L	10µg/L
2-Methylphenol	5µg/L	10µg/L
2,4-Dichlorophenol	5µg/L	10µg/L
2,4-Dimethylphenol	5µg/L	10µg/L
Phenol	5µg/L	10µg/L
2,4,6-Trichlorophenol	5µg/L	10µg/L

6. The calibration using calibration standards at concentration of 20, 50, 80, 120, and 160 mg/L (ppm) is not acceptable. The SOP should be revised for the following:

- a. The calibration standard should be at ug/L (ppb), not mg/L (ppm).
- b. The lowest calibration standard should be at 5 ug/L.

7. The acceptance criteria specified for phthalates in method blank was unacceptable. Please address the following:

- a. Method blank should not contain phthalate at concentration exceed 5 times of the MDL, not reporting limit.
- b. The criteria mentioned above should be applied to only phthalates that are encountered as common laboratory contaminants, not all of the phthalate.

I. Herbicides based on Method 8150A/8151 (LN-WALN-4110)

1. The volume of the water sample should be measured in a

graduate. The practice of assuming a density of one for water samples and weighing 500 g of sample is not acceptable.

2. The sample preparation procedure for non-aqueous samples was not acceptable because it was neither the method detailed in Method 8150B nor Method 8151.
3. The sample preparation procedure for aqueous samples was not acceptable because it was neither the method detailed in Method 8150B nor Method 8151.
4. During solvent concentration, the snyder column should be pre-wet with ethyl ether, not acetone or methylene chloride.
5. The use of quadratic calibration curves is not acceptable. If a linear fit calibration curve ($RRF \geq 0.995$) can not be drawn, then the instrument should be re-calibrated over a narrower range.

J. GC/MS Volatile Organic Compounds (Method 8240)

1. Length of time for vortexing the medium level soil extraction needs to be specified in the method.
2. The minimum RRF for all compounds, except those in SPCC should be 0.05. Compounds included in the SPCC should meet the requirements specified in the method.
3. The percent difference for all compounds in the continuing calibration checks should be $\leq 30\%$, except for compounds included in the CCC mix, which should have percent differences $\leq 20\%$.
4. Because of the high pH associated with some areas of this site, the pH of surface water and groundwater samples should be checked for proper preservation before analysis. Any instance of improper preservation should be noted in the sample results.
5. The relative standard deviation for all compounds not included in the CCC mix should be $\leq 15\%$. For any analyte that does not meet this criteria, a linear equation must be generated to quantitate the samples.
6. The workplan lists no criteria for performing tentatively identified compound (TIC) searches. Will TIC searches be performed at this site, and if so, what criteria will be used in reporting the data.
7. Methyl ethyl ketone is listed as target analytes in the QAPP, but is not listed in the volatile SOP.

8. Reporting limits for the following compounds are above the targeted quantitation limits listed in Table 7-4 of the QAPP. A detailed explanation on how the laboratory plans to meet these lower targeted quantitation limits listed in the QAPP needs to be submitted.

<u>Compound</u>	<u>Method Reporting Limit</u>	<u>Target Reporting Limit</u>
Acrolein	100µg/L	10µg/L
Acrylonitrile	50µg/L	10µg/L
2-Chloro-1,3- butadiene	100µg/L	10µg/L
trans-1,4-Dichloro- 2-butene	5µg/L	1µg/L
1,4-Dioxane	1000µg/L	500µg/L
Ethyl methacrylate	100µg/L	10µg/L
Isobutyl alcohol	1000µg/L	500µg/L
Methyl methacrylate	5µg/L	1µg/L
1,4-Dioxane	1000µg/kg	500µg/Kg
Acrylonitrile	50µg/kg	100µg/kg

9. The method needs to include a procedure for taking percent moisture. Sample results should be reported on a dry weight basis.
10. Please specify the spike level of surrogate compounds used (e.g., Addition of x ul of this surrogate standard into 5 ml of sample will yield a concentration of y ug/L.)
- K. GC/MS Volatile Organic compounds (Method 8260 for Low Level Water)
1. See comments XVII.L.1 - XVII.L.10 of this attachment.
- L. Analysis of Sulfide
1. This subject SOP is not acceptable and should be revised to be either based on method 9030A or 9031.
2. Distillation procedure must be used for sample preparation.
3. Solid samples must be preserved with zinc acetate.
4. Identify whether this SOP is for the determination of acid-soluble sulfide, acid-insoluble sulfide or else.
- M. Cyanide, Automated, Pyridine-Barbituric Acid Method
1. The analytical procedure presented for both water and soil

analysis is not acceptable due to the complex nature of the site's sample matrix. Cyanide is present in several species, including ferrous ferric cyanide. The method presented will not accurately quantify the cyanide in all the species present. An alternative procedure is described on page 4-22 of Standard Methods, 18th edition (1992).

N. Organochlorine Pesticide/PCBs (Based on Method 8080 and 8081)

1. Sample extracts should be stored at $4 \pm 2^{\circ}$ C to prevent solvent evaporation prior to and after analysis.
2. The use of the surrogate Dibutyl chlorendate (DBC) should be discontinued. Tetrachloro-m-xylene (TCMX) and decachloro-biphenyl (DCBP) should be used as the surrogates for all samples.
3. PCB analysis should be confirmed by a second dissimilar chromatography column.
4. Quadratic calibration curves should not be used for analysis. If a linear fit calibration curve ($RRF \geq 0.995$) can not be drawn, then the instrument should be re-calibrated over a narrower range.
5. For solid samples, the reporting limits for the following compounds are above the targeted quantitation limits listed in Table 7-4 of the QAPP. A detailed explanation on how the laboratory plans to meet these lower targeted quantitation limits listed in the QAPP needs to be submitted.

<u>Compound</u>	<u>Method Reporting Limit</u>	<u>Target Reporting limit</u>
alpha-BHC	8 μ g/kg	1.7 μ g/kg
beta-BHC	8 μ g/kg	1.7 μ g/kg
delta-BHC	8 μ g/kg	1.7 μ g/kg
Lindane	8 μ g/kg	1.7 μ g/kg
Heptachlor	8 μ g/kg	1.7 μ g/kg
Aldrin	8 μ g/kg	1.7 μ g/kg
Heptachlor Epoxide	8 μ g/kg	1.7 μ g/kg
Endosulfan I	8 μ g/kg	3.3 μ g/kg
Dieldrin	16 μ g/kg	3.3 μ g/kg
4,4-DDE	16 μ g/kg	3.3 μ g/kg
Endrin	16 μ g/kg	3.3 μ g/kg
Endosulfan II	16 μ g/kg	3.3 μ g/kg
4,4-DDD	16 μ g/kg	3.3 μ g/kg
Endrin aldehyde	16 μ g/kg	3.3 μ g/kg
Endosulfan sulfate	16 μ g/kg	3.3 μ g/kg
4,4-DDT	16 μ g/kg	3.3 μ g/kg
Methoxychlor	80 μ g/kg	50 μ g/kg
Chlordane	80 μ g/kg	8.3 μ g/kg

6. The inclusion of heptachlor and chlordane (Technical) in the TCLP spiking solution is not feasible since heptachlor is a constituent of chlordane. Calculating a percent recovery for heptachlor would be impossible.
7. Due to the nature of the site, GPC and sulfur cleanups may need to be performed on many of the soil samples. No procedure for these two cleanups were included in the QAPP and the SOP.

O. Graphite Furnace Analysis

1. Please specify the working linear range for each metal of interest.
2. In Section 11.2 (Method blank), please address the following:
 - a. Specify the frequency of analyzing the method blank;
 - b. Specify the acceptance criteria to be used.
 - c. Method blank should not contain metal of interest at concentration greater than the method detection limit.
3. The analytical spike protocol (Appendix II) was not fully acceptable. When Analytical results of Post-digestion spike samples show the presence of matrix effect, Method of Standard Addition (MSA) should be used and the sample reanalyzed.
4. See also comment XIII.P concerning the concentration of LCS.
5. There will be samples from this site that contain large amounts of oil that might cause broad band absorption on the graphite furnace. Care should be taken to ensure that the samples are completely oxidized.

P. Arsenic and Selenium GFAA (Sample) Preparation

1. It is not clear whether this SOP was intended for aqueous samples or both the solid and aqueous samples. If the SOP was intended to be used for aqueous, were total or dissolved metals to be determined.
2. In Section 10.1.4, if it is necessary, sample digestates should be filtered prior to being dilute to volume, and not the other way around.
3. In Section 11.2 (Method blank), please address the preparation

of method blanks.

4. The concentrations for LCS for As and Se specified in Appendix 1 (at 50 ug/l) were unacceptable. The dynamic working linear range for As and Se respectively were not specified in either this SOP or the SOP for GFAA analysis. Will the LCS at concentration of 50 ug/L actually fall at the midrange of the linear range for As and Se respectively? Please address it accordingly.
5. Using a fixed spiking level (e.g., 50 ug/L) as it was specified in Appendix 1 of this SOP was unacceptable for the following reasons:
 - a. Spike level for sample containing As and/or Se should be equal to, slightly above the sample concentration. For samples containing no As and/or Se, the spike level should be 1-5 times of the method detection limit.
 - b. Spiking at 50 ug/L could bring the total concentration of the spiked samples to exceed the dynamic linear range.
6. If aqueous samples containing suspended solid or Solid Samples are to be processed using this SOP, samples need to be homogenized before digestion.

Q. Bottle Blank SOP (NC-QA-002)

We find the subject SOP unacceptable because of the following:

1. The SOP failed to specify the volume of reagent water or freon used in each bottle blank preparation.
2. The bottle blank should not contain any analyte of interest exceeding the method detection limit, not the quantitation limit.

XIV. APPENDIX E - STANDARD OPERATING PROCEDURES FOR RESEARCH SERVICES

- A. The laboratory chain-of-custody procedure did not include the sample tracking during the sample storage, preparation (e.g., extraction, digestion), sample check-in and check out from storage, and sample analysis.

SQC-14J

Date: 04/25/95

Subject: Evaluation of Quanterra North Canton Laboratory SOPs for North Works BASF (MI) Site.

From: Patricia Scott, Chemist
Contract Analytical Services Section

Thru: Dennis Wesolowski, Chief
Contract Analytical Services Section

To: George Schupp, Chief
Quality Assurance Section

Upon review of the site QAPP for BASF North Works, I have the following comments:

1. Analytical methods for the analysis of propylene oxide and propylene glycol are not presented in this QAPP. These methods will have to be submitted before this office approves the QAPP.
2. SOPs presented for Sample Receiving (LP-WALN-8050), Sample Custody (LP-WALN-8100), Bottle Blank (LP-WALN-8350), Continuous Liquid/Liquid Extraction method for Semi-Volatile Organics in Water Samples (LM-WALN-5020), Acid Digestion of Aqueous Samples and Extracts for Total Metals for ICP (LM-WALN-2520), Acid digestions of Aqueous samples and extracts for Total Metals for GFAA (LM-WALN-2500), Total Mercury by Cold Vapor AA Spectroscopy for Aqueous Samples (LM-WALN-2030) and the TCLP Procedure (LM-WALN-2550) are acceptable. I have the following comments regarding the remaining procedures:
 - A. GC/MS Volatile Organic Compounds, Method 8240 (LM-WALN-3020) and GC/MS Volatile Organic Compounds, Method 8250, for Low Level Water ((LM-WALN_3025) These comments apply to both the low level water analysis and the multi-media method included for soil analysis:
 1. Length of time for vortexing the medium level soil extraction needs to be specified in the method.

2. The minimum RRF for all compounds, except those in SPCC should be 0.05. Compounds included in the SPCC should meet the requirements specified in the method.
3. The percent difference for all compounds in the continuing calibration checks should be $\leq 30\%$, except for compounds included in the CCC mix, which should have percent differences $\leq 20\%$.
4. Because of the high pH associated with some areas of this site, the pH of surface water and groundwater samples should be checked for proper preservation before analysis. Any instance of improper preservation should be noted in the sample results.
5. The relative standard deviation for all compounds not included in the CCC mix should be $\leq 15\%$. For any analyte that does not meet this criteria, a linear equation must be generated to quantitate the samples.
6. The workplan lists no criteria for performing tentatively identified compound (TIC) searches. Will TIC searches be performed at this site, and if so, what criteria will be used in reporting the data.
7. Methyl ethyl ketone is listed as target analytes in the QAPP, but is not listed in the volatile SOP.
8. Reporting limits for the following compounds are above the targeted quantitation limits listed in the QAPP. A detailed explanation on how the laboratory plans to meet these lower targeted quantitation limits listed in the QAPP needs to be submitted.

<u>Compound:</u>	<u>Method Reporting limit:</u>	<u>Target Reporting limit:</u>
Acrolein	100 μ g/L	10 μ g/L
Acrylonitrile	50 μ g/L	10 μ g/L
2-Chloro-1,3-butadiene	100 μ g/L	10 μ g/L
trans-1,4-Dichloro-2-butene	5 μ g/L	1 μ g/L
1,4-Dioxane	1000	500 μ g/L
Ethyl methacrylate	100 μ g/L	10 μ g/L
Isobutyl alcohol	1000 μ g/L	500 μ g/L
1,4-Dioxane	1000	500 μ g/L
Methyl methacrylate	5 μ g/L	1 μ g/L
1,4-Dioxane	1000	500 μ g/L
Acrylonitrile	50 μ g/kg	100 μ g/kg

9. The method needs to include a procedure for taking percent moisture. Sample results should be reported on a dry weight basis.

B. Herbicides Based on Method 8150A/8151 (LM-WALN-4110)

1. The volume of the water sample should be measured in a graduate. The practice of assuming a density of one and for water samples and weighing 500g of sample is not acceptable.
2. The laboratory performs the hydrolysis cleanup step before the acetic extraction of the herbicides. This differs from method 8150, which performs the acetic extraction before the hydrolysis cleanup. Laboratory data should be evaluated to ensure that this deviation from 8150 produces valid results.
3. The laboratory extraction procedure for water, in which the water sample is tumbled with 300mL of ethyl ether for one hour differs from method 8150 which performs 3 ethyl ether solvent extractions in a separatory funnel. Laboratory data should be evaluated to ensure that this deviation from 8150 produces valid results.
4. During solvent concentration, the Snyder column should be pre-wet with ethyl ether, not acetone or methylene chloride.
5. The use of quadratic calibration curves is not acceptable. If a linear fit calibration curve ($RRF \geq 0.995$) can not be drawn, then the instrument should be re-calibrated over a narrower range.

C. Sonication Extraction Method for BNAs, Pesticide/PCBS, OPPs, TRPHIRs and Extractable TPHs in Solid Samples (LM-WALN-5060).

1. Before performing the soil sonication for SVOA analysis, the pH of the soil needs to be taken. If the pH is above 10, no target acid compounds or surrogates will be recovered from the sample. The pH of the sample should be adjusted with 1:1 HCL to a pH of 7.
2. The method needs to include a procedure for taking percent moisture. Sample results should be reported on a dry weight basis.

D. GC/MS Semivolatile Organic Compound Capillary Column
Technique based on Method 8270 (LM-WALN-3040).

1. The percent difference for all compounds in the continuing calibration checks should be $\leq 30\%$, except for compounds included in the CCC mix, which should have percent differences $\leq 20\%$. The 50% difference in continuing calibration listed in the laboratory method seems excessive.
2. The relative standard deviation for all compounds not included in the CCC mix should be $\leq 15\%$. For any analyte that does not meet this criteria, a linear equation must be generated for sample quantitation.
3. The workplan lists no criteria for performing tentatively identified compound (TIC) searches. Will TIC searches be performed at this site, and if so, what criteria will be used in reporting the data.
4. Aniline and n-nitrosodimethyl amine are listed as SVOA analytes for the site, but is not listed as analytes in the SVOA methods.
5. Reporting limits in the laboratory methods for the following compounds are above the targeted quantitation limits listed in the QAPP. A detailed explanation on how the laboratory plans to meet these lower targeted quatitation limits listed in the QAPP needs to be submitted.

<u>Compound:</u>	<u>Target Reporting limit:</u>	<u>Method Reporting limit:</u>
Acenaphthene	5µg/L	10µg/L
Acenaphthylene	5µg/L	10µg/L
Anthracene	5µg/L	10µg/L
Benzo(a)anthracene	5µg/L	10µg/L
Benzo(b)fluoranthene	5µg/L	10µg/L
Benzo(k)fluoranthene	5µg/L	10µg/L
Benzo(ghi)perylene	5µg/L	10µg/L
Benzo(a)pyrene	5µg/L	10µg/L
bis(2-Chloroethyl)ether	5µg/L	10µg/L
bis(2-Ethylhexyl)phthalate	5µg/L	10µg/L
4-Bromophenol phenyl ether	5µg/L	10µg/L
Butyl benzyl phthalate	5µg/L	10µg/L
Chrysene	5µg/L	10µg/L
Diallate	5µg/L	10µg/L
Dibenz(ah)anthracene	5µg/L	10µg/L
Dibenzofuran	5µg/L	10µg/L
di-n-Butylphthalate	5µg/L	10µg/L

<u>Compound:</u>	<u>Target Reporting limit:</u>	<u>Method Reporting limit:</u>
Diethylphthalate	5µg/L	10µg/L
Dimethylphthalate	5µg/L	10µg/L
2,4-Dinitrotoluene	5µg/L	10µg/L
2,6-Dinitrotoluene	5µg/L	10µg/L
Fluoranthene	5µg/L	10µg/L
Fluorene	5µg/L	10µg/L
Hexachlorobenzene	5µg/L	10µg/L
Hexachlorobutadiene	5µg/L	10µg/L
Hexachlorocyclopentadiene	5µg/L	10µg/L
Hexachloroethane	5µg/L	10µg/L
Indeno(123-cd)pyrene	5µg/L	10µg/L
Isophorone	10µg/L	20µg/L
Isasafrole	5µg/L	10µg/L
2-Methylnaphthalene	5µg/L	10µg/L
Naphthalene	5µg/L	10µg/L
Nitrobenzene	5µg/L	10µg/L
n-Nitrosodiphenylamine	5µg/L	10µg/L
n-Nitrosodi-n-propylamine	5µg/L	10µg/L
Pentachlorobenzene	5µg/L	10µg/L
Phenanthrene	5µg/L	10µg/L
Pyrene	5µg/L	10µg/L
1,2,4,5-Tetrachlorobenzene	5µg/L	10µg/L
1,2,4-Trichlorobenzene	5µg/L	10µg/L
4-Chloro-3-methylphenol	5µg/L	10µg/L
2-Chlorophenol	5µg/L	10µg/L
2-Methylphenol	5µg/L	10µg/L
2,4-Dichlorophenol	5µg/L	10µg/L
2,4-Dimethylphenol	5µg/L	10µg/L
Phenol	5µg/L	10µg/L
2,4,6-Trichlorophenol	5µg/L	10µg/L

E. Organochlorine Pesticide/Polychlorinated Biphenyls Based on Method 8080 and 8081 (LM-WALN-4060).

1. Sample extracts should be stored at 4±2° C to prevent solvent evaporation prior to and after analysis.
2. The use of the surrogate Dibutyl chloridate should be discontinued. Tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCBP) should be used as the surrogates for all samples.
3. PCB analysis should be confirmed by a second dissimilar chromatography column.
4. Quadratic calibration curves should not be used for analysis. If a linear fit calibration curve (RRF≥0.995) can not be drawn, then the instrument should be re-calibrated over a narrower range.

5. Reporting limits for the following compounds are above the targeted quantitation limits listed in the QAPP. A detailed explanation on how the laboratory plans to meet these lower targeted quatitation limits listed in the QAPP needs to be submitted.

<u>Compound:</u>	<u>Method</u> <u>Reporting limit:</u>	<u>Target</u> <u>Reporting limit:</u>
alpha-BHC	8µg/kg	1.7µg/kg
beta-BHC	8µg/kg	1.7µg/kg
delta-BHC	8µg/kg	1.7µg/kg
Lindane	8µg/kg	1.7µg/kg
Heptachlor	8µg/kg	1.7µg/kg
Aldrin	8µg/kg	1.7µg/kg
Heptachlor Epoxide	8µg/kg	1.7µg/kg
Endosulfan I	8µg/kg	3.3µg/kg
Dieldrin	16µg/kg	3.3µg/kg
4,4-DDE	16µg/kg	3.3µg/kg
Endrin	16µg/kg	3.3µg/kg
Endosulfan II	16µg/kg	3.3µg/kg
4,4-DDD	16µg/kg	3.3µg/kg
Endrin aldehyde	16µg/kg	3.3µg/kg
Endosulfan sulfate	16µg/kg	3.3µg/kg
4,4-DDT	16µg/kg	3.3µg/kg
Methoxychlor	80µg/kg	50µg/kg
Chlordane	80µg/kg	8.3µg/kg

6. The inclusion of heptachlor and chlordane (Technical) in the TCLP spiking solution is not feasible since heptachlor is a constituent of chlordane. Calculating a percent recovery for heptachlor would be impossible.
7. Due to the nature of the site, GPC and sulfur cleanups may need to be performed on many of the soil samples. No procedure for these two cleanups were included in the QAPP.
- F. Acid Digestion of Sediments, sludges and soils for metal analysis by GFAA, FLAA or ICP (LM-WALN-2530)
1. Samples need to be homogenized before extraction.
- G. Arsenic and Selenium GFAA Preparation (LM-WALN-2510)
1. Solid Samples need to be homogenized before extraction:

H. Graphite Furnace Analysis (LM-WALN-2010)

This method is acceptable. There will be samples from this site that contain large amounts of oil that might cause broad band absorption on the graphite furnace. Care should be taken to ensure that the samples are completely oxidized.

I. Analysis of Water and Soil Samples for Metals by ICP Spectroscopy (LM-WALN-2040)

1. Method only uses a 1-point calibration. RCRA method 6010A requires a 3-point calibration.

2. In order to meet the targeted quantitation limits stated in the QAPP, the following metals will have to be measured by GFAA:

Antimony	Arsenic
Cadmium	Chromium
Lead	Selenium
Thallium	Zinc
Vanadium	

3. The high pH present in some parts of the site ($\text{pH} \geq 11$) may reduce the probability of finding metals in some samples, since many metals are not soluble in water at this pH.

J. Analysis of Soil Digests for total Hg by Cold Vapor AA Spectroscopy (LM-WALN-2031)

1. Soil results should be reported on a dry-weight basis.

K. Analysis of Sulfide (LM-WALN-1330).

The analytical procedure presented is acceptable for the analysis of water samples, but is not acceptable for the analysis of soil samples. To prevent thiocyanides and cyanide, which are present at the site, from interfering with the titration, a distillation step must be added to the method. (See SW846 method 9030A)

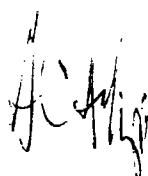
L. Analysis of Cyanide (LM-WALN-1141) and (LM-WALN-1142)

The analytical procedure presented for both water and soil analysis is not acceptable due to the complex nature of the site's matrix. Cyanide is present in several species, including ferrous ferric cyanide. The method presented will not accurately quantify the cyanide in all the species present. An alternative procedure is described on page 4-22 of Standard Methods, 18th edition (1992).

DATE: APR 10 1995

SUBJECT: Review Request of Revision 0 Quality Assurance
Project Plan (QAPjP) of the RCRA (RFI/CMS) at
BASF, MI

FROM: George C. Schupp, Chief
Quality Assurance Section



TO: Dennis J. Wesolowski, Chief
Contract Analytical Services Section

The Quality Assurance Section is requesting comments from the Central Regional Laboratory regarding the analytical, chain-of-custody and data reduction/validation/reporting aspects of the subject QAPjP necessary to conduct a laboratory audit.

Please find attached one copy of the QAPjP and all associated plans for your review. The QAS requests that all comments be provided by C.O.B. 5-5-95.

The QAS has not completed its review of the QAPjP. A copy of QAS' comments will be forwarded when they are completed. Please provide both a hardcopy & diskette version to expedite incorporation of the CRL's comments for the QAS' memorandum to the Office of RCRA.

ATTACHMENT(S): Revision 0 QAPjP

SEP 29 1994

HRE-8J

Mr. Adam Bickel
BASF Corporation, Inc.
1609 Biddle Ave.
Wyandotte, MI 48192-3799

RE: **Draft Comments**
QAPjP of the RCRA RFI
North Works
MID 064 197 742

Dear Mr. Bickel:

As discussed, enclosed are **draft comments** on the Quality Assurance Project Plan (QAPjP) of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). I have reserved room 811, in the Metcalfe Federal Building, 77 W. Jackson Blvd., from 9:00 am to 2:30 pm, to discuss these draft comments. Final comments on the complete RFI will be available after the Michigan Department of Natural Resources (MDNR) and Region 5's Water Division sediment team complete their reviews and all other draft comments are consolidated with the QAPjP comments. For your information, Jon Russell of MDNR's Environmental Response Division is reviewing the RFI. Ms. Rhonda Blayer of the MDNR's Waste Management Division also briefly reviewed the RFI, but ERD will be the MDNR's lead contact. If time permits, we can also discuss the response from the United States Fish and Wildlife Service regarding endangered species concerns at the meeting as well as any other issues of BASF Corporation concern.

If you have any questions, comments or concerns, do not hesitate to contact me at (312) 886-6199.

Sincerely,

COPY

Diane M. Sharrow
Environmental Scientist/Ecologist
Michigan/Wisconsin Technical Enforcement Section
RCRA Enforcement Branch
Office of RCRA
Waste Management Division

Enclosure (20 pages)

cc: J. Lanigan, WCC w/enclosure
L. Aubuchon, MDNR WMD-Livonia
R. Blayer, MDNR WMD
J. Russell, MDNR ERD-Livonia

bcc: R. Pallesen, ORC
M. DeRosa, REB
M. Williams, WD
W. Tong, WD

HRE-8J:Sharrow:DMS886-6199:SharrowBASFDisk:September 29, 1994

June 29, 1994
4E07014-400

Ms. Diane Sharrow
United States Environmental Protection Agency
Region V, (HRE-8J)
77 West Jackson Street
Chicago, Illinois 60604

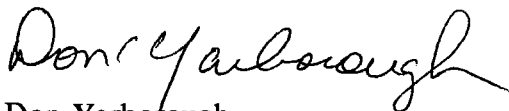
Subject: Submittal of Work Plans, RCRA Facility Investigation
Docket No.: V-W-011-94
BASF Corporation, Wyandotte, Michigan

Dear Ms. Sharrow:

BASF Corporation submits three copies of the Quality Assurance Project Plan and the Current Conditions Report for the Wyandotte facility.

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,



Don Yarborough
Wyandotte Site Manager

Enclosures

cc: A. Bickel - BASF
J.C. Lanigan, Jr. - WCC

DET21516

HRE-8J

CERTIFIED MAIL P 188 577 421
RETURN RECEIPT REQUESTED

Mr. Bruce D. Roberts
Project Coordinator
BASF Corporation
1609 Biddle Avenue
Wyandotte, Michigan 48192

RE: RFI Workplan - Conditional QAPP Approval
BASF Corporation - North Works
USEPA ID NO.: MID 064 197 742

Dear Mr. Roberts:

The United States Environmental Protection Agency (U.S. EPA) has completed review of BASF Corporation, Incorporated's (BASF) submittal of October 12, 1995, and BASF's submittal of October 18, 1995. U.S. EPA hereby conditionally approves the BASF QAPP. This conditional approval includes resolution of U.S. EPA's comments on the RFI Workplan (QAPP) that were deferred until a Laboratory Evaluation or Audit of the RFI Laboratory were conducted by U.S. EPA.

The conditions of approval are as follows:

1) Data Validation:

Section 9.2.3 (Procedures to Validate Laboratory Data), first sentence: Change the sentence to read "Validation of analytical data (100% **back to the raw data**) will be performed by the Data Validation Manager or designee...".

2) Incorporation of Lab Audit Comments:

Enclosed is the document "Lab Audit Conditions for QAPP Approval Summary". Enclosed with the summary is the subject memorandum "Evaluation of Quanterra Environmental Services, North Canton, Ohio, for RFI at BASF Corporation, Wyandotte, Michigan". The Memorandum is essentially the laboratory audit evaluation. All

conditions specified in the lab audit conditions document must be addressed by BASF and its contractors prior to "full" implementation of the RFI Workplan/QAPP.

3) Use of Revised/Corporate SOPs:

It is U.S. EPA's understanding that the corporate SOPs developed by Quanterra are being revised not only to reflect updates to SW-846, but also for Quanterra's own corporate purposes. U.S. EPA understands the rationale for development of these corporate SOPs. However, these SOPs lack the detail that Region 5 needs to approve corrective action implementation at the North Works. Therefore, there are specific references made to "facility SOPs" in the lab audit summary. This refers to the SOPs submitted from Quanterra's North Canton laboratory and need to be addressed in terms of incorporation of the appropriate SOPs into the QAPP. In addition, U.S. EPA requires all samples taken at the North Works must be analyzed by the Quanterra's North Canton Laboratory, except where agreed to by U.S. EPA (e.g., samples taken from the Prussian Blue areas).

4) Revision of SOP Tables:

All SOP Tables in the QAPP must be reviewed, revised and submitted to U.S. EPA, as appropriate, to reflect U.S. EPA's comments and conditions in these enclosures. For example, even Tables 6-1 (calibration) and 11-1 (preventive maintenance) needs to be modified because graphite furnace methods will not be used for this project.

5) Detection Limits:

U.S. EPA has provided guidance and suggestions in the Enclosure on which of the Michigan "Act 307" detection limits are achievable. U.S. EPA is only requiring BASF to do what is achievable with regards to 307 detection limits, unless otherwise instructed in the Attachment.

6) PDC Spill Area:

In order to characterize the PDC spill area sufficiently, a limited TIC search protocol should be developed to focus on the metabolites in the spill area. See comment (h) on page 13 of the "Evaluation of Quanterra . . .". document that is attached to the enclosure.

BASF should submit any required items within thirty (30) days of the certified receipt date of this letter.

Mr. DeRosa, Mr. Payne and myself appreciate the cooperation and effort that BASF extended to prepare the October 12, 1995, and October 18, 1995, responses, as well as the cooperation of Quanterra's staff during the Laboratory Audit, and during preparation of the Laboratory Audit Report. I regret the various delays in responding to your submittals, most notably the two government furloughs.

If you have any questions or concerns regarding this letter or the enclosed comments, do not hesitate to contact me at (312) 886-6199.

Respectfully,

Diane M. Sharrow
Project Manager

Enclosure

cc: R. Blayer, MDNR - Lansing
L. Aubuchon, MDNR - Livonia
J. Russell, MDNR - Livonia

bcc: Author
Section File
R. Pallesen, ORC
L. Lodisio, SEMI
M. DeRosa, ECAB
D. Payne, WPTD

Lab Audit Conditions for QAPP Approval Summary

A. QAPP approval is given for the following:

1. Appendix IX semivolatiles (Method 8270 Facility SOP) and Pesticides/PCBs (Method 8080 SOP LM-WALN-4060) used in conjunction with sample preparation of soils/water (SOP CORP-0P-0001). The corrective actions recommended for Method 8270 are minor, by nature, and do not affect the approval/disapproval of this test procedure. Corrective actions recommended for Method 8270 are specified in the lab audit report and are easy to implement.
2. Mercury in soil/water.
3. Sulfide in water.
4. Method 8015 for propylene oxide on soil/water.
5. Method 8015 for propylene glycol in soil/water.

B. QAPP approval is given with conditions for the following:

1. Appendix IX Volatiles (Method 8240 - Soil) and Appendix IX Volatiles (Method 8260 - Water).

CONDITIONS:

- a) Update Tables in the two Facility SOPs, as described in the attached Report ("Evaluation of Quanterra Environmental Services, for RFI at BASF Corporation in Wyandotte, Michigan).
- b) Volatile data packages should contain experimental reference spectra appropriate for data validation.
- c) Quanterra should re-evaluate standard concentrations being used for water miscible volatiles in both 5 ml and 25 ml sample aliquots. Standard concentration changes should be reflected in updated Tables of two Facility SOPs.
- d) SOPs should establish conditions to obtain appropriate experimental mass spectra for acrolein, acetonitrile, propionitrile and dibromochloropropane.

2. Appendix IX Metals (soil/water).

CONDITIONS:

- a. ICP Method 6010A and ICP Trace Method 6010A will be used

for metals (SOP NC-MT-006). As a minimum the ICP Trace will be used for As, Pb, Se, Tl and Sb in water, and As, Se, Tl and Sb in soils. The attached lab audit report further discusses the two instruments.

b. Soils for mercury, cyanide and metals will be dried/homogenized prior to sample preparation by Facility SOPs.

c) QAPP Tables will need to be rewritten to reflect use of SOP NC-MT006.

d) NIST SRM Soils Numbers 2709, 2710, and 2711 will be used to demonstrate appropriate accuracy for soils of both ICP Method 6010A and ICP Trace. See the lab audit report for more information.

3. Appendix IX Herbicides (Method 8150).

CONDITIONS:

a) Establish acceptance criteria for surrogate spike recoveries.

b) Decrease, as appropriate, the concentrations used for surrogate and matrix spikes.

4. Alternative Methods are proposed for the following compounds:

a) 1,4 Dioxane (Method 8270).

b) Hexachlorophene (Method 8150).

5. Cis 1,2-dichloroethene and α -chlordane and γ -chlordane should be reported with Appendix IX results.

6. Other alternative methods are discussed in the attached Report. Aramite and p-phenylene diamine can be reported as "not detectable". The nine organophosphorus pesticides (OPP) compounds can be deleted from the QAPP.

C. The following test procedures are not acceptable, and are discussed in the attached lab audit report:

1. Sulfide in soil - This soil parameter may be deleted from the RFI.

2. Cyanide - Prussian Blue areas. Additional information will be provided to BASF in the near future.

3. SOP CORP-GC-0001, and Appendix A to CORP-OP-0001, for Method 8150. The facility SOPs will be utilized.

4. SOP CORP-MT-0003 for graphite furnace atomic absorption. All of these SOPs will be deleted as this instrument will not be utilized for this project.

HRE-8J

CERTIFIED MAIL P 188 577 421
RETURN RECEIPT REQUESTED

Mr. Bruce D. Roberts
Project Coordinator
BASF Corporation
1609 Biddle Avenue
Wyandotte, Michigan 48192

RE: RFI Workplan - QAPP Approval
BASF Corporation - North Works
USEPA ID NO.: MID 064 197 742

Dear Mr. Roberts:

The United States Environmental Protection Agency (U.S. EPA) has prepared this letter with regards to the following:

- 1) BASF Corporation, Incorporated's (BASF) submittal of October 12, 1995;
- 2) U.S. EPA's comments on the RFI Workplan (QAPP) that were deferred until a Laboratory Evaluation or Audit of the RFI Laboratory were conducted by U.S. EPA; and
- 3) BASF's submittal of October 18, 1995.

This letter acknowledges the timely submittal of a high quality response to U.S. EPA's comments of August 10, 1995. Mr. DeRosa, Mr. Payne and myself appreciate the cooperation and effort that BASF extended to prepare the October 12, 1995, and October 18, 1995, responses, as well as the cooperation of Quanterra's staff during the Laboratory Audit, and during preparation of the Laboratory Audit Report. I would also like to personally apologize for the various delays in responding to your submittals, in addition to the three government furloughs.

BASF's RFI Workplan-QAPP are approved, with four conditions. These conditions are as follows:

1) Data Validation:

Section 9.2.3 Procedures to Validate Laboratory Data must be revised to state that validation of analytical data back to the raw data will be performed by the Data Validation Manager or designee. Several additional data validation conditions and concerns will be provided to you, under separate cover, later next week.

2) Use of Revised/Corporate SOPs:

U.S. EPA will not review any additional Corporate SOPs submitted by BASF after the date of this approval letter. It is U.S. EPA's understanding that the corporate SOPs developed by Quanterra are being revised not only to reflect updates to SW-846, but also for Quanterra's own corporate purposes. It is U.S. EPA's belief that these SOPs lack the detail that Region 5 needs to approve corrective action implementation at the North Works. In addition, all samples taken at the North Works must be analyzed by the Quanterra's North Canton Laboratory, except where agreed to by U.S. EPA (e.g., samples taken from the Prussian Blue areas).

3) Revision of SOP Tables:

All SOP Tables in the QAPP must be reviewed, revised and submitted to U.S. EPA, as appropriate, to reflect U.S. EPA's comments and conditions in the Enclosure.

(Mike DeRosa - I need your list of Tables)

4) Detection Limits:

U.S. EPA has provided guidance and suggestions in the Enclosure on which of the Michigan "Act 307" detection limits are achievable. U.S. EPA is only requiring BASF to do what is achievable with regards to 307 detection limits, unless otherwise instructed in the Attachment.

Enclosed is the "QAPP APPROVAL SUMMARY". Attached to the Summary is the subject Memorandum "EVALUATION OF QUANTERRA ENVIRONMENTAL SERVICES, FOR RFI AT BASF AT WYANDOTTE". The Memorandum is essentially a summary of the Laboratory Audit. The actual Laboratory Audit is being prepared and will be distributed in the next few weeks by U.S. EPA. However, all conditions that must be addressed by BASF and its contractors prior to "full" implementation of the RFI Workplan/QAPP are contained within this letter and the Enclosure. BASF should submit any required items within thirty (30) days of the certified receipt date of this letter.

If you have any questions or concerns regarding this letter or the enclosed comments, do not hesitate to contact me at (312) 886-6199.

Respectfully,

Diane M. Sharrow
Project Manager

Enclosure

cc: BASF Counsel
R. Blayer, MDNR - Lansing
L. Aubuchon, MDNR - Livonia
J. Russell, MDNR - Livonia

bcc: Author
Section File
R. Pallesen, ORC
L.Lodisio, SEMI
M. DeRosa, ECAB
D. Payne, WPTD

QAPP APPROVAL SUMMARY

A. QAPP approval is given for the following:

1. Appendix IX semivolatiles (Method 8270 Facility SOP) and Pesticides/PCBs (Method 8080 SOP LM-WALN-4060) used in conjunction with sample preparation of soils/water (SOP CORP-OP-0001). The corrective actions recommended for Method 8270 are minor, by nature, and do not affect the approval/disapproval of this test procedure. Corrective actions recommended for Method 8270 are easy to implement.

2. Mercury in soil/water.

3. Sulfide in water.

4. Method 8015 for propylene oxide on soil/water.

5. Method 8015 for propylene glycol in soil/water.

B. QAPP approval is given with conditions for the following:

1. Appendix IX Volatiles (Method 8240 - Soil) and Appendix IX Volatiles (Method 8260 - Water).

CONDITIONS:

a) Update Tables in the two Facility SOPs, as described in the attached Report ("Evaluation of Quanterra Environmental Services, for RFI at BASF Corporation in Wyandotte, Michigan).

b) Volatile data packages should contain experimental reference spectra appropriate for data validation.

c) Quanterra should re-evaluate standard concentrations being used for water miscible volatiles in both 5 ml and 25 ml sample aliquots. Standard concentration changes should be reflected in updated Tables of two Facility SOPs.

d) SOPs should establish conditions to obtain appropriate experimental mass spectra for acrolein, acetonitrile, propionitrile and dibromochloropropane.

2. Appendix IX Metals (soil/water).

CONDITIONS:

a. ICP Method 6010A and ICP Trace Method 6010A will be used for metals (SOP NC-MT-006). As a minimum the ICP Trace will be used for As, Pb, Se, Tl and Sb in water, and As, Se, Tl and Sb

in soils. The attached Report further discusses the two instruments.

b. Soils for mercury, cyanide and metals will be dried/homogenized prior to sample preparation by Facility SOPs.

c) QAPP Tables will need to be rewritten to reflect use of SOP NC-MT006.

d) NIST SRM Soils Numbers 2709, 2710, and 2711 will be used to demonstrate accuracy of ICP Trace.

3. Appendix IX Herbicides (Method 8150).

CONDITIONS:

a) Establish acceptance criteria for surrogate spike recoveries.

b) Decrease, as appropriate, the concentrations used for surrogate and matrix spikes.

4. Alternative Methods are proposed for the following compounds.

a) 1,4 Dioxane (Method 8270).

b) Hexachlorophene (Method 8150 as soon as practical).

5. Cis 1,2-dichlorethene and a-chlordane and g-chlordane should be reported with Appendix IX results.

6. Other alternative methods are discussed in the attached Report. Aramite and p. phenylene diamene can be reported as "not detectable". The nine organophosphorus pesticides (OPP) compounds can be deleted from the QAPP as BASF thinks appropriate.

C. The following test procedures are not acceptable, and are discussed in the attached Report.

1. Sulfide in soil - This soil parameter may be deleted from the RFI.

2. Cyanide - Prussian Blue areas.

3. SOP CORP-GC-0001, and Appendix A to CORP-OP-0001, for Method 8150.

4. SOP CORP-MT-0003 for graphite furnace atomic absorption.

TABLE A COMPARISON OF LABORATORY SOPs

MARCH QAPP SOP NAME	QAPP REVISION 1 SOP NAME	TITLE	COMMENTS
-----	CORP-MT-0003	GRAPHITE FURNACE ATOMIC ABSORPTION SPECTROSCOPY, SW-846 METHOD 7000A AND MCAWW 200 SERIES METHODS	NEW CORPORATE SOP
LM-WALN-2010	NC-MT-0002	GRAPHITE FURNACE ANALYSIS	UPDATED
LM-WALN-2031	NC-MT-0005	ANALYSIS OF SOIL DIGESTATES FOR TOTAL MERCURY BY COLD VAPOR ATOMIC ABSORPTION SPECTROSCOPY	UPDATED
LM-WALN-2030	LM-WALN-2030	TOTAL MERCURY BY COLD VAPOR ATOMIC ABSORPTION SPECTROSCOPY FOR AQUEOUS SAMPLES	NO CHANGE
LM-WALN-1330	LM-WALN-1330	SULFIDE	NO CHANGE
-----	NC-WC-0010	PH ELECTROMETRIC METHOD	NEW SOP
LM-WALN-3020	LM-WALN-3020	GC/MS VOLATILE ORGANIC COMPOUNDS METHOD 8240	REVISED
LM-WALN-3025	NC-MS-0002	GC/MS VOLATILE ORGANIC COMPOUNDS METHOD 8260 FOR LOW LEVEL	UPDATED
LM-WALN-3040	NC-MS-0004	GC/MS SEMIVOLATILE ORGANIC COMPOUNDS CAPILLARY COLUMN TECHNIQUE BASED ON METHOD 8270	UPDATED
LM-WALN-4060	LM-WALN-4060	ORGANOCHLORINE PESTICIDES/POLY- CHLORINATED BIPHENYLS BASED ON METHOD 8080 AND 8081	NO CHANGE
LM-WALN-4110	LM-WALN-4110	HERBICIDES BASED ON METHOD 8150A/8151	REVISED
LM-WALN-1141	LM-WALN-1141	CYANIDE AUTOMATED, PYRIDINE-BARBITURIC ACID METHOD	NO CHANGE
LM-WALN-4180	NC-GC-0021	METHOD 8015A - MODIFIED NON-HALOGENATED ORGANIC COMPOUNDS	UPDATED
LM-WALN-4185	NC-GC-0022	METHOD 8015A - MODIFIED GLYCOL COMPOUNDS	UPDATED

NOTE:

1. SOPs BEGINNING WITH "CORP" ARE CORPORATE SOPs
2. SOPs BEGINNING WITH "LM" ARE OLDER SITE SPECIFIC SOPs
3. SOPs BEGINNING WITH "NC" ARE NEWER SITE SPECIFIC SOPs
4. SOP CORP-GC-0001 IS USED IN CONJUNCTION WITH LM-WALN-4060 & LM-WALN-4110
5. SOP CORP-OP-0001 IS USED IN CONJUNCTION WITH LM-WALN-5020 & LM-WALN-5060
6. SOP CORP-MT-0001 IS USED IN CONJUNCTION WITH NC-MT-0006
7. SOP CORP-MT-0003 IS USED IN CONJUNCTION WITH NC-MT-0002

TABLE A COMPARISON OF LABORATORY SOPs

MARCH QAPP SOP NAME	QAPP REVISION 1 SOP NAME	TITLE	COMMENTS
LP-WALN-8050	NC-SC-0005	SAMPLE RECEIVING	UPDATED
NC-QA-0002	NC-QA-0002	BOTTLE BLANK SOP	REVISED
NC-SC-0001	NC-SC-0001	SAMPLE CONTROL	NO CHANGE
-----	NC-WC-0004	TOTAL SOLIDS, PERCENT MOISTURE, ASH AND TOTAL VOLATILE SOLIDS	NEW SOP
LP-WALN-2510	NC-IP-0002	ARSENIC AND SELENIUM GFAA PREPARATION	UPDATED
LP-WALN-2520	NC-IP-0003	AQUEOUS ICP & FLAA ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	UPDATED
LM-WALN-2500	LM-WALN-2500	AQUEOUS GFAA PREPARATION ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	NO CHANGE
LM-WALN-2530	LM-WALN-2530	ACID DIGESTION OF SEDIMENTS, SLUDGES, AND SOILS FOR METAL ANALYSIS BY GFAA, FLAA OR ICP	NO CHANGE
-----	CORP-GC-0001	GAS CHROMATOGRAPHIC ANALYSIS BASED ON METHOD 8000A, 8010B, 8020A, 8021A, 8080A AND 8150B, SW-846	NEW CORPORATE SOP
-----	NC-OP-0009	GEL PERMEATION CHROMATOGRAPHY CLEANUP	NEW FACILITY SOP
-----	NC-OP-0013	SULFURIC ACID CLEANUP	NEW FACILITY SOP
-----	CORP-OP-0001	EXTRACTION AND CLEANUP OF ORGANIC COMPOUNDS FROM WATERS AND SOILS, BASED ON SW-846 3500 SERIES, 3600 SERIES 8150 AND 600 SERIES METHODS	NEW CORPORATE SOP
LM-WALN-5020	LM-WALN-5020	CONTINUOUS LIQUID/LIQUID EXTRACTION METHOD FOR SEMI- VOLATILE ORGANICS IN WATER SAMPLES	NO CHANGE
LM-WALN-5060	LM-WALN-5060	SONICATION EXTRACTION METHOD FOR BNAs, PESTICIDES/PCBs, OPPs, TRPHIRs, AND EXTRACTABLE TPHs IN SOLID SAMPLES	NO CHANGE
LM-WALN-1142	NC-WC-0032	CYANIDE DISTILLATION METHOD	UPDATED
LM-WALN-2550	NC-IP-0005	TOXICITY CHARACTERISTIC LEACHATE PROCEDURE (TCLP)	UPDATED
-----	CORP-MT-0001	INDUCTIVELY COUPLED PLASMA-ATOMIC EMISSION SPECTROSCOPY, SPECTROMETRIC METHOD FOR TRACE ELEMENT ANALYSIS, METHOD 6010A AND METHOD 200.7	NEW CORPORATE SOP
LM-WALN-2040	NC-MT-0006	ANALYSIS OF WATER AND SOIL SAMPLES FOR METALS BY INDUCTIVELY COUPLED PLASMA SPECTROSCOPY	UPDATED

TABLE A COMPARISON OF LABORATORY SOPs

MARCH QAPP SOP NAME	QAPP REVISION 1 SOP NAME	TITLE	COMMENTS
-----	CORP-MT-0003	GRAPHITE FURNACE ATOMIC ABSORPTION SPECTROSCOPY, SW-846 METHOD 7000A AND MCAWW 200 SERIES METHODS	NEW CORPORATE SOP
LM-WALN-2010	NC-MT-0002	GRAPHITE FURNACE ANALYSIS	UPDATED
LM-WALN-2031	NC-MT-0005	ANALYSIS OF SOIL DIGESTATES FOR TOTAL MERCURY BY COLD VAPOR ATOMIC ABSORPTION SPECTROSCOPY	UPDATED
LM-WALN-2030	LM-WALN-2030	TOTAL MERCURY BY COLD VAPOR ATOMIC ABSORPTION SPECTROSCOPY FOR AQUEOUS SAMPLES	NO CHANGE
LM-WALN-1330	LM-WALN-1330	SULFIDE	NO CHANGE
-----	NC-WC-0010	PH ELECTROMETRIC METHOD	NEW SOP
LM-WALN-3020	LM-WALN-3020	GC/MS VOLATILE ORGANIC COMPOUNDS METHOD 8240	REVISED
LM-WALN-3025	NC-MS-0002	GC/MS VOLATILE ORGANIC COMPOUNDS METHOD 8260 FOR LOW LEVEL	UPDATED
LM-WALN-3040	NC-MS-0004	GC/MS SEMIVOLATILE ORGANIC COMPOUNDS CAPILLARY COLUMN TECHNIQUE BASED ON METHOD 8270	UPDATED
LM-WALN-4060	LM-WALN-4060	ORGANOCHLORINE PESTICIDES/POLY- CHLORINATED BIPHENYLS BASED ON METHOD 8080 AND 8081	NO CHANGE
LM-WALN-4110	LM-WALN-4110	HERBICIDES BASED ON METHOD 8150A/8151	REVISED
LM-WALN-1141	LM-WALN-1141	CYANIDE AUTOMATED, PYRIDINE-BARBITURIC ACID METHOD	NO CHANGE
LM-WALN-4180	NC-GC-0021	METHOD 8015A - MODIFIED NON-HALOGENATED ORGANIC COMPOUNDS	UPDATED
LM-WALN-4185	NC-GC-0022	METHOD 8015A - MODIFIED GLYCOL COMPOUNDS	UPDATED

NOTE:

1. SOPs BEGINNING WITH "CORP" ARE CORPORATE SOPs
2. SOPs BEGINNING WITH "LM" ARE OLDER SITE SPECIFIC SOPs
3. SOPs BEGINNING WITH "NC" ARE NEWER SITE SPECIFIC SOPs
4. SOP CORP-GC-0001 IS USED IN CONJUNCTION WITH LM-WALN-4060 & LM-WALN-4110
5. SOP CORP-OP-0001 IS USED IN CONJUNCTION WITH LM-WALN-5020 & LM-WALN-5060
6. SOP CORP-MT-0001 IS USED IN CONJUNCTION WITH NC-MT-0006
7. SOP CORP-MT-0003 IS USED IN CONJUNCTION WITH NC-MT-0002

TABLE A COMPARISON OF LABORATORY SOPs

MARCH QAPP SOP NAME	QAPP REVISION 1 SOP NAME	TITLE	COMMENTS
LP-WALN-8050	NC-SC-0005	SAMPLE RECEIVING	UPDATED
NC-QA-0002	NC-QA-0002	BOTTLE BLANK SOP	REVISED
NC-SC-0001	NC-SC-0001	SAMPLE CONTROL	NO CHANGE
-----	NC-WC-0004	TOTAL SOLIDS, PERCENT MOISTURE, ASH AND TOTAL VOLATILE SOLIDS	NEW SOP
LP-WALN-2510	NC-IP-0002	ARSENIC AND SELENIUM GFAA PREPARATION	UPDATED
LP-WALN-2520	NC-IP-0003	AQUEOUS ICP & FLAA ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	UPDATED
LM-WALN-2500	LM-WALN-2500	AQUEOUS GFAA PREPARATION ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	NO CHANGE
LM-WALN-2530	LM-WALN-2530	ACID DIGESTION OF SEDIMENTS, SLUDGES, AND SOILS FOR METAL ANALYSIS BY GFAA, FLAA OR ICP	NO CHANGE
-----	CORP-GC-0001	GAS CHROMATOGRAPHIC ANALYSIS BASED ON METHOD 8000A, 8010B, 8020A, 8021A, 8080A AND 8150B, SW-846	NEW CORPORATE SOP
-----	NC-OP-0009	GEL PERMEATION CHROMATOGRAPHY CLEANUP	NEW FACILITY SOP
-----	NC-OP-0013	SULFURIC ACID CLEANUP	NEW FACILITY SOP
-----	CORP-OP-0001	EXTRACTION AND CLEANUP OF ORGANIC COMPOUNDS FROM WATERS AND SOILS, BASED ON SW-846 3500 SERIES, 3600 SERIES 8150 AND 600 SERIES METHODS	NEW CORPORATE SOP
LM-WALN-5020	LM-WALN-5020	CONTINUOUS LIQUID/LIQUID EXTRACTION METHOD FOR SEMI- VOLATILE ORGANICS IN WATER SAMPLES	NO CHANGE
LM-WALN-5060	LM-WALN-5060	SONICATION EXTRACTION METHOD FOR BNAs, PESTICIDES/PCBs, OPPs, TRPHIRs, AND EXTRACTABLE TPHs IN SOLID SAMPLES	NO CHANGE
LM-WALN-1142	NC-WC-0032	CYANIDE DISTILLATION METHOD	UPDATED
LM-WALN-2550	NC-IP-0005	TOXICITY CHARACTERISTIC LEACHATE PROCEDURE (TCLP)	UPDATED
-----	CORP-MT-0001	INDUCTIVELY COUPLED PLASMA-ATOMIC EMISSION SPECTROSCOPY, SPECTROMETRIC METHOD FOR TRACE ELEMENT ANALYSIS, METHOD 6010A AND METHOD 200.7	NEW CORPORATE SOP
LM-WALN-2040	NC-MT-0006	ANALYSIS OF WATER AND SOIL SAMPLES FOR METALS BY INDUCTIVELY COUPLED PLASMA SPECTROSCOPY	UPDATED

QAPP approval is given for the following:

1. Appendix IX semivolatiles (Method 8270 Facility SOP) and Pesticides/PCBs (Method 8080 SOP LM-WALN-4060) used in conjunction with sample preparation of soils/water (SOP CORP-OP-0001). The corrective actions recommended for Method 8270 are minor, by nature, and do not affect the approval/disapproval of this test procedure. Corrective actions recommended for Method 8270 are easy to implement.
2. Mercury in soil/water.
3. Sulfide in water.
4. Method 8015 for propylene oxide on soil/water.
5. Method 8015 for propylene glycol in soil/water.

QAPP approval is given with conditions for the following:

1. Appendix IX Volatiles (Method 8240 - Soil) and Appendix IX Volatiles (Method 8260 - Water).

CONDITIONS:

- a) Update Tables in the two Facility SOPs, as described in the attached Report ("Evaluation of Quanterra Environmental Services, for RFI at BASF Corporation in Wyandotte, Michigan).
- b) Volatile data packages should contain experimental reference spectra appropriate for data validation.
- c) Quanterra should re-evaluate standard concentrations being used for water miscible volatiles in both 5 ml and 25 ml sample aliquots. Standard concentration changes should be reflected in updated Tables of two Facility SOPs.
- d) SOPs should establish conditions to obtain appropriate experimental mass spectra for acrolein, acetonitrile, propionitrile and dibromochloropropane.

2. Appendix IX Metals (soil/water).

CONDITIONS:

- a. ICP Method 6010A and ICP Trace Method 6010A will be used for metals (SOP NC-MT-006). As a minimum the ICP Trace will be used for As, Pb, Se, Tl and Sb in water, and As, Se, Tl and Sb in soils. The attached Report further discusses the two instruments.
- b. Soils for mercury, cyanide and metals will be dried/homogenized prior to sample preparation by Facility SOPs.

c) QAPP Tables will need to be rewritten to reflect use of SOP NC-MT006.

d) NIST SRM Soils Numbers 2709, 2710, and 2711 will be used to demonstrate accuracy of ICP Trace.

3. Appendix IX Herbicides (Method 8150).

CONDITIONS:

a) Establish acceptance criteria for surrogate spike recoveries.

b) Decrease, as appropriate, the concentrations used for surrogate and matrix spikes.

4. Alternative Methods are proposed for the following compounds.

a) 1,4 Dioxane (Method 8270).

b) Hexachlorophene (Method 8150 as soon as practical).

5. Cis 1,2-dichlorethene and a-chlordane and g-chlordane should be reported with Appendix IX results.

6. Other alternative methods are discussed in the attached Report. Aramite and p. phenylene diamene can be reported as "not detectable". The nine organophosphorus pesticides (OPP) compounds can be deleted from the QAPP as BASF thinks appropriate.

The following test procedures are not acceptable, and are discussed in the attached Report.

1. Sulfide in soil - This soil parameter may be deleted from the RFI.

2. Cyanide - Prussian Blue ares.

3. SOP CORP-GC-0001, and Appendix A to CORP-OP-0001, for Method 8150.

4. SOP CORP-MT-0003 for graphite furnace atomic absorption.

Date : 16-AUG-95 19:18

Client ID:

Sample Info: ACID SPIKE 250NG/5ML

Purge Volume: 5.0

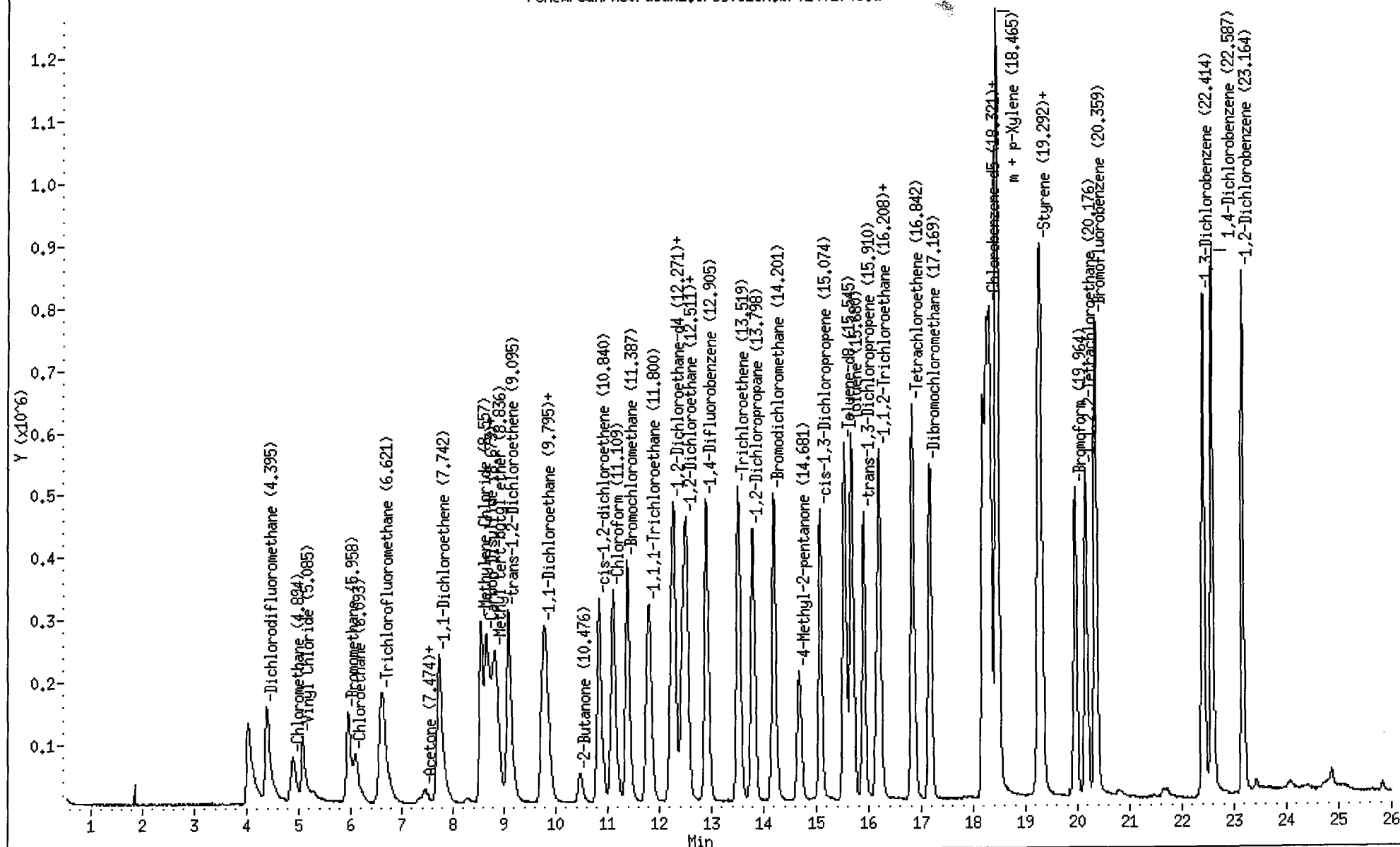
Column phase: DB624 75m

Instrument: a3ux1.i

Operator: 001840

Column diameter: 0.53

/chem/can/msv/a3ux1.i/U50816A.b/V2401743.d



QUANTERRA-NORTH CANTON

VOLATILE REPORT SW-846 Method

Data file : /chem/can/msv/a3ux1.i/U50816A.b/V2401743.d

Lab Smp Id:

Inj Date : 16-AUG-95 19:18

Autotune Date: 02-Jun-95 09:45

Operator : 001840

Inst ID: a3ux1.i

Smp Info : ACID SPIKE 250NG/5ML

Misc Info :

Comment :

Method : /chem/can/msv/a3ux1.i/U50816A.b/8240LUX1.m

Meth Date : 16-Aug-1995 09:01 waybrigh Quant Type: ISTD

Cal Date : 16-AUG-95 07:10

Cal File: V0101720.d

Als bottle: 24

Dil Factor: 1.000

Integrator: HP RTE

Compound Sublist: 8240.sub

Target Version: 3.12

Concentration Formula: 1/Vo

Name	Value	Description
Vo	5.000	Sample volume

Compounds	QUANT SIG				CONCENTRATIONS		
	MASS	RT	EXP RT	REL RT	ON-COLUMN	FINAL	
					(ng)	(UG/L)	
=====	=====	==	=====	=====	=====	=====	=====
* 1 Bromochloromethane	128.00	11.397	11.369	(1.000)	244731	250.00	
* 2 1,4-Difluorobenzene	114.00	12.905	12.897	(1.000)	1025446	250.00	
* 3 Chlorobenzene-d5	117.00	18.205	18.192	(1.000)	831745	250.00	
\$ 4 1,2-Dichloroethane-d4	65.00	12.290	12.281	(1.078)	445837	259.42	51.884
\$ 5 Toluene-d8	98.00	15.545	15.540	(0.854)	1032022	251.32	50.264
\$ 6 Bromofluorobenzene	95.00	20.359	20.357	(1.118)	761889	249.99	49.999
8 Chloromethane	50.00	4.894	4.889	(0.429)	335364	229.14	45.829
10 Bromomethane	94.00	5.958	5.925	(0.523)	370503	236.01	47.201
9 Vinyl Chloride	62.00	5.085	5.052	(0.446)	325094	221.36	44.272
11 Chloroethane	64.00	6.112	6.079	(0.536)	213037	226.94	45.389
16 Methylene Chloride	84.00	8.567	8.536	(0.752)	394568	243.59	48.718
14 Acetone	43.00	7.474	7.442	(0.656)	107170	181.54	36.309(a)
17 Carbon Disulfide	76.00	8.673	8.642	(0.761)	1012002	229.78	45.956
15 1,1-Dichloroethene	96.00	7.742	7.711	(0.679)	375603	241.13	48.226
21 1,1-Dichloroethane	63.00	9.814	9.804	(0.861)	758031	240.75	48.149
19 trans-1,2-Dichloroethene	96.00	9.095	9.074	(0.798)	409503	237.64	47.527
M 81 1,2-Dichloroethene (total)	96.00				857556	484.07	96.813
23 cis-1,2-dichloroethene	96.00	10.840	10.831	(0.951)	448053	246.20	49.240
24 Chloroform	83.00	11.109	11.090	(0.975)	851386	249.10	49.821
27 1,2-Dichloroethane	62.00	12.444	12.426	(1.092)	543897	251.54	50.308
22 2-Butanone	43.00	10.476	10.456	(0.919)	208962	232.95	46.590(a)
25 1,1,1-Trichloroethane	97.00	11.800	11.782	(0.914)	743812	249.09	49.818
26 Carbon Tetrachloride	117.00	12.251	12.243	(0.949)	629637	249.43	49.885

Compounds	QUANT SIG					CONCENTRATIONS	
	MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN (ng)	FINAL (UG/L)
=====	=====	==	=====	=====	=====	=====	=====
20 Vinyl acetate	43.00	9.757	9.727	(0.756)	948066	247.82	49.563(a)
31 Bromodichloromethane	83.00	14.201	14.194	(1.100)	861752	250.41	50.082
30 1,2-Dichloropropane	63.00	13.807	13.791	(1.070)	472891	249.08	49.817
34 cis-1,3-Dichloropropene	75.00	15.084	15.069	(1.169)	649533	242.40	48.479
29 Trichloroethene	130.00	13.519	13.512	(1.048)	424054	246.49	49.299
40 Dibromochloromethane	129.00	17.169	17.165	(1.330)	683911	249.12	49.825
38 1,1,2-Trichloroethane	97.00	16.218	16.204	(1.257)	436382	253.59	50.718
28 Benzene	78.00	12.511	12.503	(0.969)	1006845	249.95	49.989
36 trans-1,3-Dichloropropene	75.00	15.910	15.905	(1.233)	571179	248.86	49.772
46 Bromoform	173.00	19.964	19.962	(1.547)	543101	254.56	50.912
33 4-Methyl-2-pentanone	43.00	14.681	14.656	(0.806)	522282	196.24	39.248(a)
37 2-Hexanone	43.00	16.160	16.146	(0.888)	335052	260.44	52.088
39 Tetrachloroethene	164.00	16.842	16.838	(0.925)	405341	238.56	47.713
47 1,1,2,2-Tetrachloroethane	83.00	20.176	20.174	(1.108)	783742	262.30	52.459
35 Toluene	91.00	15.689	15.675	(0.862)	1156541	246.97	49.395
41 Chlorobenzene	112.00	18.273	18.269	(1.004)	823351	236.96	47.392
42 Ethylbenzene	106.00	18.340	18.327	(1.007)	369086	230.26	46.053
45 Styrene	104.00	19.321	19.308	(1.061)	803612	234.20	46.840
43 m + p-Xylene	106.00	18.465	18.462	(1.014)	976115	473.28	94.656
44 Xylene-o	106.00	19.263	19.260	(1.058)	485774	244.72	48.944
M 80 Xylenes (total)	106.00				1461890	717.80	143.56
32 2-Chloroethyl vinyl ether	63.00		14.607		Compound Not Detected.		
48 1,3-Dichlorobenzene	146.00	22.423	22.422	(1.232)	752488	245.20	49.039
49 1,4-Dichlorobenzene	146.00	22.587	22.586	(1.241)	777315	240.67	48.134
50 1,2-Dichlorobenzene	146.00	23.174	23.173	(1.273)	697500	245.44	49.089
13 Acrolein	56.00	7.368	7.327	(0.646)	23983	621.34	124.27
18 Acrylonitrile	53.00	8.730	8.719	(0.766)	217347	544.06	108.81
12 Trichlorofluoromethane	101.00	6.611	6.588	(0.580)	782672	228.88	45.776
7 Dichlorodifluoromethane	85.00	4.395	4.361	(0.386)	562458	230.36	46.072
82 Methyl tert-butyl ether	73.00	8.836	8.815	(0.775)	874676	260.56	52.112

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

QUANTERRA-NORTH CANTON

Unknown Compounds Quantitation Report

Data file : /chem/can/msv/a3ux1.i/U50816A.b/V2401743.d
Lab Smp Id:
Inj Date : 16-AUG-95 19:18 Autotune Date: 02-Jun-95 09:45:2
Operator : 001840 Inst ID: a3ux1.i
Smp Info : ACID SPIKE 250NG/5ML
Misc Info :
Comment :
Method : /chem/can/msv/a3ux1.i/U50816A.b/8240LUX1.m
Meth Date : 16-Aug-1995 09:01 waybrigh
Cal Date : 16-AUG-95 07:10 Cal File: V0101720.d
Als bottle: 24
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: 8240.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
* 1 Bromochloromethane	11.397	2158034	250.000

RT	AREA	CONCENTRATIONS		QUAL	QUANT		
		ON-COL(ng)	FINAL(UG/L)		LIBRARY	LIB ENTRY	CPND #
=====	=====	=====	=====	=====	=====	=====	=====
Unknown					CAS #:		
4.031	1073187	124.32	24.865	0		0	1

QUANTERRA-NORTH CANTON

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: a3ux1.i
Lab File ID: V2401743.d
Lab Smp Id:

Calibration Date: 08/16/95
Calibration Time: 0710

Analysis Type: VOA

Level: LOW

Quant Type: ISTD

Sample Type: WATER

Operator: 001840

Method File: /chem/can/msv/a3ux1.i/U50816A.b/8240LUX1.m

Misc Info:

COMPOUND	STANDARD	AREA LIMIT		SAMPLE	% DIFF
		LOWER	UPPER		
1 Bromochloromethane	382043	191022	764086	244731	-35.94
2 1,4-Difluorobenzene	1647438	823719	3294876	1025446	-37.76
3 Chlorobenzene-d5	1317413	658706	2634826	831745	-36.87

COMPOUND	STANDARD	RT LIMIT		SAMPLE	% DIFF
		LOWER	UPPER		
1 Bromochloromethane	11.37	10.87	11.87	11.40	0.25
2 1,4-Difluorobenzene	12.90	12.40	13.40	12.90	0.06
3 Chlorobenzene-d5	18.19	17.69	18.69	18.20	0.07

AREA UPPER LIMIT = +100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = + 0.50 minutes of internal standard RT.

RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

QUANTERRA-NORTH CANTON

RECOVERY REPORT

Client Name: Client SDG: U50816A
Sample Matrix: LIQUID Fraction: VOA
Lab Smp Id:
Level: LOW Operator: 001840
Data Type: MS DATA SampleType: SAMPLE
SpikeList File: H20spk.spk Quant Type: ISTD
Method File: /chem/can/msv/a3ux1.i/U50816A.b/8240LUX1.m
Misc Info:

SURROGATE COMPOUND	CONC ADDED UG/L	CONC RECOVERED UG/L	% RECOVERED	LIMITS
\$ 4 1,2-Dichloroethane	50.000	51.884	103.77	76-114
\$ 5 Toluene-d8	50.000	50.264	100.53	88-110
\$ 6 Bromofluorobenzene	50.000	49.999	100.00	86-115